A STUDY TO ASSESS THE EFFECTIVENESS OF KALEIDOSCOPE ON PAIN AND BEHAVIORAL RESPONSES AMONG CHILDREN (4-10 YEARS) DURING IV CANNULATION IN SELECTED HOSPITAL, COIMBATORE

By

Reg. No: 301216104

A DISSERTATION SUBMITTED TO THE TAMIL NADU Dr. M. G. R. MEDICAL UNIVERSITY, CHENNAI IN PARTIAL FULFILLMENT OF REQUIREMENT FOR THE DEGREE OF MASTER OF SCIENCE IN NURSING

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Dedicated to
Almighty God,
Lovable
Husband,
Parents, Sister,
Friends & Well
Wishers

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CHAPTER - I

Introduction

"If the children are given in the necessary tools to succeed, they will succeed beyond their widest dreams"

- David Vitter, 2010

Global Health Observatory (2009) stated that children contribute to one third of the global population and they are the basic resource for the future mankind. Children are vulnerable to all kinds of illness. This vulnerability is mainly due to immature development of physical, intellectual and immune system, and they often get hospitalized due to their vulnerability. A child who faces hospitalization is no exception.

Children's hospital of Philadelphia (2010) stated that children are the pride of the nation; it is the duty of every one as a citizen to keep up this unit of pride safety for the benefits of the country. We should sensitive to the feelings, needs and tastes of the children to build a better tomorrow. We shouldn't only show love and affection and provide protection and security to the children but also ensure them a sound health. Health care experiences including hospital and medical procedures can be very stressful for the children's of all ages, among this pain is the most traumatic experience that the children fears.

Wongs (2007) described that illness and hospitalization are the first crisis, that children face major stressors of hospitalization include separation, loss of control, bodily injury and pain. Many children exhibit anxiety as a part of crisis.

The International Association for the Study of Pain (2010) stated that pain is an unpleasant sensory and emotional experience associated with actual and potential damage. Children admitted to hospital often experience pain from various treatments and test, as well as from illness itself. A child's anxiety and fear of a procedure and actual pain experience during the procedure often are manifested by the child's distress behavior such as crying, avoidance of action, regression and refusal to cooperate. The child's distress is upsetting not only for the child but also for the both parents and professionals.

Wongs (2007) explained that children between the age groups of 4-10 years are preschooler's and schooler. They are concrete, ego centric and magical thinking that limits their ability to understand the events because they view all the experience from their own self referred perspective. Children fears needle and pain it's inflict the estimation of needle phobia ranges from 4.9% - 9%.

WHO (2011) stated that one of the most common invasive nursing procedure is insertion of an intravenous catheter which has a long track record of being painful, stressful for the patients. In an effort to promote comfort during intravenous cannulation, nurses may use various techniques to reduce the discomfort of the patient. Among the various methods of pain management, relief of pain is basic need and right of all the people. Distraction has shown to be an effective non pharmacological pain management technique. Effective distraction technique may reduce pain through its distraction process.

Bagnasco. E. Pezzi (2006) stated that intravenous cannulation is a complex phenomenon. It is not only the pain, but also the anticipation of pain that contributes

to the complexity of phenomenon. It is preferable to use the simple effective intervention to reduce the distress. It is reported that anxiety in children can increase subjective perception of pain, but it can be reduced if their attention is focused on a pleasant manner.

Carol Taylor (2008) described that the reticular activating system inhibits painful stimuli when a child receives sufficient or excessive sensory input like distraction. Distraction is a pleasurable stimuli causes the release of endorphins, the natural opioid neuromodulators present in the brain and in the spinal cord. These modulators bind to specific opioid receptor sites throughout the nervous system and it block the release or production of pain transmitting substances and there by modulates the pain perception.

Dona Hockenberry (2007) stated that distraction is a non pharmacological technique that draws person's attention away from the noxious stimuli through passively redirecting the subject's attention or by actively involving the subjects in the performance of diversion task. It is useful for young children and easy to administer. The types of distracters are visual, tactile or auditory, other distracters like blowing bubble, kaleidoscope, and flash light are being used.

Hasanpour, et.al., (2006) stated that kaleidoscope is a cylinder with mirrors containing loose coloured objects such as beads, pebbles and bits of glass. As the viewer looks it into one end light entering the other creates a colourful pattern due to the reflection of the mirrors.

Need for the Study

Murtry. M. C (2010) stated that Children's distress during painful medical procedures is strongly influenced by adult behavior. Adult reassurance (e.g. "its okay") is associated with increased child distress where as distraction is associated with increased child coping. It is unknown why reassurance shows this counter intuitive relationship with child distress. The elimination of pain and suffering by various distractions is an important responsibility of nurse who cares the children, because the unmanaged pain results in variety of long term consequences.

The data shows that nearly 6.4 million hospitals stay of children less than 17 years are reported in US in 2009. In 2011, Indian census reveals some shocking data about the child in the age group of 0-8 years of child population in India has decreased, where as overall population has increased about 17.64 in last 10 years. There are 200 children per 10,000 populations suffer from pain due to hospitalization that is approximately 90% of all children (WHO, 2005).

Walersteiner. R (2010) stated that health experts are giving importance to alternative therapies like balloon blowing, vapocoolant spray, music therapy, swaddling technique etc to treat pain rather than medicine alone. The incidence of pain during intravenous cannulation was 90-95% because, it is the most common invasive procedure for patients in the hospital. With the rising concept of evidence based nursing practice, complementary and alternative medicines are playing a vital role in reducing pain.

Carlson, et.al., (2006) founded that younger children had significantly more distress than others during the painful cannulation, among these preschoolers are most

indeed of intervention to reduce distress during procedure. These studies suggest that passive distraction techniques are more effective.

Jones (2004) stated that preparation of child for the painful procedures is an intervention that requires the provision of sensory procedural information and coping skills. Distraction or imagery can used to reduce both qualitative and quantitative aspects of pain experience.

Janet Mccalman (2009) stated that pain perception in children is complex, and if often difficult to assess. In addition, Pain management in children is not always optimized in various health care settings, including emergency departments. Review of pain assessment scales that can be used in children of all ages and distraction techniques during painful procedures are presented. Age specific non pharmacological interventions are used to manage pain in children, and it is most effective when adapted to the developmental level of the child.

Livesely. J (2011) stated that intravenous cannulation is the most common invasive procedure performed by health team members. Health team members are giving importance to distraction technique which will be helpful during the intravenous cannulation.

Desiree lie (2010) conducted a survey among 1385 children, reported that they experienced high level of pain during venipuncture which directly lead to the avoidance of subsequent treatment in 5-7% by these young people. An evidence based review of approach to pain reduction reported that parental reassurance, humour, distractions that reduce distress.

Scand. J. Caring (2011) conducted a study on pain in children (3-16 years) on impact of daily life and parent perception in Norway, among 200 children. Pain problems in children have increased during the last 20 years and have been identified as important public health problems. He concluded that 60 % of children reported with pain in previous three months. Pain increased with age, where children aged 3-5 years reported the most pain. Most prevalence of chronic pain was 21%. Children reported impact on social life as inability to pursue hobbies, disturbed sleep, and absence from school because of pain.

So it is the challenge of the health care professional is to pay attention to the management of pain during invasive procedure. This intended the researcher to do a study to assess the effectiveness of kaleidoscope on pain and behavioral responses among children during IV cannulation.

Statement of the Problem

A study to assess the effectiveness of kaleidoscope on pain and behavioral responses among children (4-10 yrs) during IV cannulation in selected hospital at Coimbatore.

Objectives

- To assess the pain and behavioral response during IV cannulization in control group.
- To provide kaleidoscope to the experimental group.
- To assess the effectiveness of kaleidoscope on pain and behavioral responses during IV cannulation in experimental group.

- To compare the pain and behavioral responses of children in both groups undergoing IV Cannulation.
- To determine the association between pain and behavioral responses among experimental and control group with selected Demographic variables.

Hypothesis

H_1 There is a significant difference in the pain and behavioral responses among children undergoing IV cannulation in experimental and control group.

H_2 There is a significant association between the selected demographic variable with the pain and behavioral scores in experimental and control group.

Operational Definitions

Assess

It refers to the judgment in response to pain and behavior.

Effectiveness

Refers to the ability of the kaleidoscope on pain and behavioral responses as evidenced by difference in the scores of experimental and control group.

Kaleidoscope

An optical instrument used to shifting away the attention of children during intravenous cannulation through which various shapes and colors are observed.

Pain

The subjective unpleasant feeling of the children as a result of intravenous cannulation which is measured by Wong Bakers faces pain scale.

Behavioral Response

The psycho physiological reaction exhibited by the child subjected to intravenous cannulation which is measured in Modified behavioral pain scale.

Children

Children between 4-10 years belong to the preschoolers and schoolers admitted in the selected hospitals.

Intravenous Cannulation

A hollow needle peripherally inserted in to the vein for the administration of medications and fluids.

Assumptions

- Intravenous cannulation is a painful invasive procedure.
- One of the non pharmacological methods to manage pain is distraction.
- Kaleidoscope is effective in reducing pain during cannulation.

CHAPTER - II

Review of Literature

Review of literature is a broad, comprehensive, in depth systematic and critical view of scholarly publications and unpublished scholarly print material and personal communication.

Nancy Groove (2012) stated that review of literature is an essential step in the whole process of research, as it provides the current theoretical and scientific knowledge about a particular problem enabling to synthesis what is known and not known. It is also used to designate a written summary of the state or art on a research problem.

The Review of literature was Done for the Present Study and Presented in the Following Headings

- Literature related to pain and its management during intravenous cannulation.
- Literature related to various distraction therapies in reducing pain and behavioral response.
- Literature related to the effectiveness of kaleidoscope in reducing pain and behavioral response.

Literature Related to Pain and its Management During Intravenous Cannulation

Joel Fein, Debra Polls (2014) conducted an interventional study in Philadelphia to assess the effectiveness of buzzy (a battery powered reusable device that provide cold and vibration) in reducing the pain associated with IV cannulation in

emergency department among children 4-18 years. Sample size consisted of 500 children and the study was conducted from 2011-2013. Pain was measured using Wong Bakers faces pain scale and it is revealed that about 70% of children experience only mild pain during the procedure.

Brown. S. C (2009) conducted a randomized control study in Toronto to evaluate the effectiveness of pedisedate for reducing distress and pain in children during cannulation among 3-9 years old children by using observational scale and pain scale during and after the procedure. Sample size consisted of 36 children. The results revealed that children with pedisedate have significant reduction in pain during invasive procedure**.**

Rajiv Balan IJP (2009) a prospective randomized control study was conducted to determine the comparative efficiency of local anesthetic cream and Indian classical instrument in reducing pain due to venipuncture in children. Purposively selected children aged 5-12 years are randomly assigned into 2 groups and the pain level was assessed by visual analogue scale. The results revealed that pain experienced during venipuncture is significantly reduced by EMLA cream and Indian classical instrument.

Taddio (2009) conducted a descriptive study in Canada, to determine the efficiency of various psychological strategies including breathing exercise for reducing pain and distress among children during cannulation between the age groups of 2-5 years. Sample size consisted of 1150 children. The result showed that the breathing exercise reduces the pain to certain level.

Kennedy (2008) conducted a descriptive study to reduce the pain during needle insertion among 170 children's ranging from 3-17 years of age. The visual analogue scale was used and they found that children between 3-6 years experienced 36% of mild pain and 23% of children from 7-17 years reported moderate to severe pain.

Dutt Gupta (2007) conducted a randomized control study in 101 children during intravenous cannulation. Throughout the procedure effective communication is maintained between them and pain is measured by using verbal numerical rating scale and about 49 participants feel less pain than without communication. It revealed that effective communication reduces the pain.

Celik (2012) conducted a study among the 50 children who receives intravenous cannulation for hemodialysis. They often experience unbearable pain during their dialysis. They are provided with vapocoolant spray versus lignocaine cream, 25 children treated with vapocoolant spray were others received lignocaine cream. Pain perception was recorded using visual analogue scale. It is revealed that ethyl chloride vapocoolant spray is less effective when compared to the lignocaine cream. Lignocaine is very effective in reducing the mild to moderate pain.

Cohen. L. L (2008) conducted an interventional study to reduce the pain during intravenous cannulation using behavioral approaches to anxiety and fear to the needle. Researcher provided training in coping skill along with sensory procedural information to 50 children between the age groups of 8-14 years and the pain was assessed using numerical pain scale. It is being identified that the child can able to adapt to the painful experience very effectively with parental support.

Gupta. D (2007) conducted a prospective and randomized study in India to evaluate the efficiency of balloon inflation among 65 pediatric children aged 6-12 years during cannulation. The children were divided into three groups 25 of each; Group I (control), Group II pressed a rubber ball as a distraction, and Group III inflated a balloon. Visual analogue scale was used to assess the pain score. The results revealed that the child with balloon inflation has significant reduction in pain than the other two groups during the procedure.

Literature Related to Various Distraction Therapies in Reducing Pain and Behavioral Response

Fatemah (2009) conducted a quasi experimental study in Iran to assess the effectiveness of programmed distraction on pain caused by venipuncture among adolescents and children on hemodialysis. Totally 42 children are selected as a sample. The children are advised to look at the 2 similar pictures and tell the number of differences between them during venipuncture. The results showed that after distraction the pain intensity during venipuncture is significantly reduced. This concluded that the effect of simple inexpensive distraction is a quick way for decreasing the pain.

Inal. S (2012) conducted a randomized control study in Turkey to assess the effectiveness of distraction cards among 6-12 years children during venipuncture. Sample size consist of 123 children, the results revealed that the experimental group had significantly lower pain level than the control group.

Biermier (2007) conducted a study to assess the effectiveness of distraction during venipuncture in children with cancer. 50 children between 5-18 years are

selected randomly and provided standard therapy to the control group and distraction to the experimental group. The distraction given is bubbles, music's and super challenger books according to their choice. Colour analogue scale was used. Results showed that the intervention group experienced less pain when compared to the control group.

Bagnascco (2010) conducted a study in Italy among 203 children aged 2-5 years were selected for venipuncture. They started venipuncture 2-3 minutes after beginning of a movie or a cartoon. At the end child was asked to give a score intensity of pain from 0-10 by using FLACC scale. Among 203, 31 children experienced no pain, 118 experienced mild pain, 49 scored moderate pain and 4 said severe pain.

Tahereh. S. Deghi (2010) conducted a randomized clinical trial in Iran, among 4-6 year of age group children to assess the effectiveness of pressing a small soft ball during intravenous catheter insertion on pain related behavioral responses of children. The 60 children were selected through simple randomized sampling method. Data were collected using FLACC scale. In the intervention group, children were asked to press the soft ball during IV catheter insertion. Results revealed that distraction through pressing a soft ball was effective in reducing the behavioral responses of pain in children who are all undergone IV catheter placement.

Sandhya Ghai (2012) conducted a quasi experimental study in India to evaluate the effectiveness of animated cartoons as a distraction strategy on behavioral response to pain perception among children undergoing venipuncture. 50 children were selected through purposive sampling. The tools used for the study was FLACC

pain scale. The results revealed that there is less pain related behavioral responses with use of animated cartoons as a distraction strategy during venipuncture.

Sharkawi. E. L (2006) conducted a comparative study to evaluate the effect of distraction using audio-visual glass and local anesthesia for children. 48 healthy children 5-7 years old were selected. Children's are randomly assessed by using Wong Bakers faces pain scale and FLACC scale. This result shows that audiovisual glasses are very effective to reduce the pain than the local anesthesia.

Rushford. J. A (2006) conducted a cross sectional study to assess the behavioral response of the healthy infants to pain during blood sampling among 36 full term infants and 31 preterm infants. It shows that healthy full term infants have high degree of pain than the preterm infants.

Bellini (2006) conducted a study to assess the analgesic effect of watching TV during venipuncture among 69 children aged 7-12 years are grouped into two. A control group without distraction, experimental group is distracted with TV cartoon. The result revealed that experimental group perceived less pain than control group.

Carla Morrow (2010) conducted a randomized control trial to assess the effectiveness of swaddling technique in reducing neonatal pain during routine heel lance procedure among neonates. 42 neonates were selected through a randomized controlled trial. Infants in the experimental group (n=22) were swaddled and held in an upright position during routine heel lance procedures while neonates in the control group (n=20) remained in a standard care position. Pain was measured with NIPS

scale. The study shows significant reduction in pain level in experimental group than the control group.

Literature Related to the Effectiveness of Kaleidoscope in Reducing Pain and Behavioral Response

Beebe. A (2010) conducted a study in the pediatric OPD to evaluate the effectiveness of kaleidoscope as a distraction technique among hospitalized children during acute pain experience using convenient sampling. 60 subjects were selected 30 in the experimental and 30 in the control group. The findings revealed that children in experimental group reported 37% low intensity of pain and control group reported 43% high intensity of pain. It concluded that kaleidoscope is effective distracters for pain.

Tufeki (2008) conducted a descriptive study in Turkey and the study involved 206 children who underwent venipuncture process. The control groups consist of 101 children provided standard care and children in the interventional group provided with kaleidoscope. Faces and visual analogue scale was used. It was detected that kaleidoscope is effectively reducing the pain in school children.

Windich–Birmier (2007) conducted a study in Canada to investigate the effectiveness of distraction technique in reducing a child perceived pain. A convenient sample of 100 children aged 3 years to 12 years was selected. Control groups are being comforted by physical touch and soft voices and experimental group are encouraged to look through the kaleidoscope as a distraction technique. The results revealed that experimental group perceived less pain and demonstrated less distress.

Ali Fakhr (2006) conducted a study in Turkey to examine the effectiveness and feasibility of distraction with kaleidoscope in reducing behavioral distress, pain and fear during venipuncture on intravenous insertion. Two group randomized block design was used, in which convenient sample of 385 children who were undergoing medical treatment in 13 pediatric hospitals. The findings showed that the experimental group perceived less pain and demonstrated less distress and fear.

Carlson (2006) conducted a study to investigate the effectiveness of distraction technique in reducing the child perceived pain among 100 children aged 3-12 years who were assigned experimental and control group. Experimental group was encouraged to look through kaleidoscope. Wong Bakers faces pain scale and CHEOPS scale was used for measurement of pain and distress respectively. Findings revealed that experimental group perceives less pain.

Gristylane Chyrmang (2010) conducted a study in India to assess the effectiveness of kaleidoscopic distraction on reduction of pain during invasive procedure. A convenient sample of 60 children aged 2-8 years were assigned as experimental and control group. The finding revealed that experimental group perceived less pain than the control group.

Conceptual Framework

A conceptual frame work is a theoretical approach to study the problems that are scientifically based which emphasize selection, arrangement, and classification of its concept. Selecting a nursing conceptual framework helps the researcher to identify problems that are of significance to the discipline of nursing. Framework guiding a study is not merely a review of the literature, but also creative product of the researcher's appraisal of the literature (Tomy and Alligood, 2007).

According to the Widenbach's, the practice of nursing comprises a wide variety of services each directed towards the attainment of one of its five components. The five realities identified by wiedenbach's are agent, recipient, goal, mean and framework.

Agent

The agent is the practicing nurse who has the personal attributes, commitment, and competence to provide nursing care. In this study the agent is the researcher who provides kaleidoscope to the children who will undergo intravenous cannulation in selected hospital.

Recipient

The recipient is the one who receives the nursing actions. In this study recipients are the children between the age group of 4-10 years who receives IV cannulation.

Goal

The goal is the nurse desired outcome. In this study the goal is to reduce pain and behavioral responses.

Means

The means are the activities and devices used by the nurse to achieve the goal. In this study kaleidoscope is the means of reducing the pain.

Framework

It refers to the facilities in which the nursing is practiced. In this study the frame work is the treatment room.

Step - I Identifying the Need for Help

Identification involves individualization of the patient, his experiences and recognition of the patient perception of his condition. In this study the investigators identifies the demographic variables and assessment of pain and behavioral responses using Wong Bakers Faces pain scale and modified behavioral pain assessment scale. The central purpose is to manage pain and behavioral responses effectively.

Step - II Ministering the Need for Help

Ministration is providing the needed help. It requires the identification of the need for help, the selection of a helping measure appropriate to that need, and acceptability by the patient. Kaleidoscope was provided to the children who receive IV cannulation.

Step - III Validation that the Need for Help was Met

Validation is evidenced that the patient functional ability will be restored as a result of the help given. It is validating that the needed help delivered in achieving the central purpose. This step involves the post assessment done after administering the help and analysis was done to make suitable decision and recommended action either to continue or modify the nursing action.

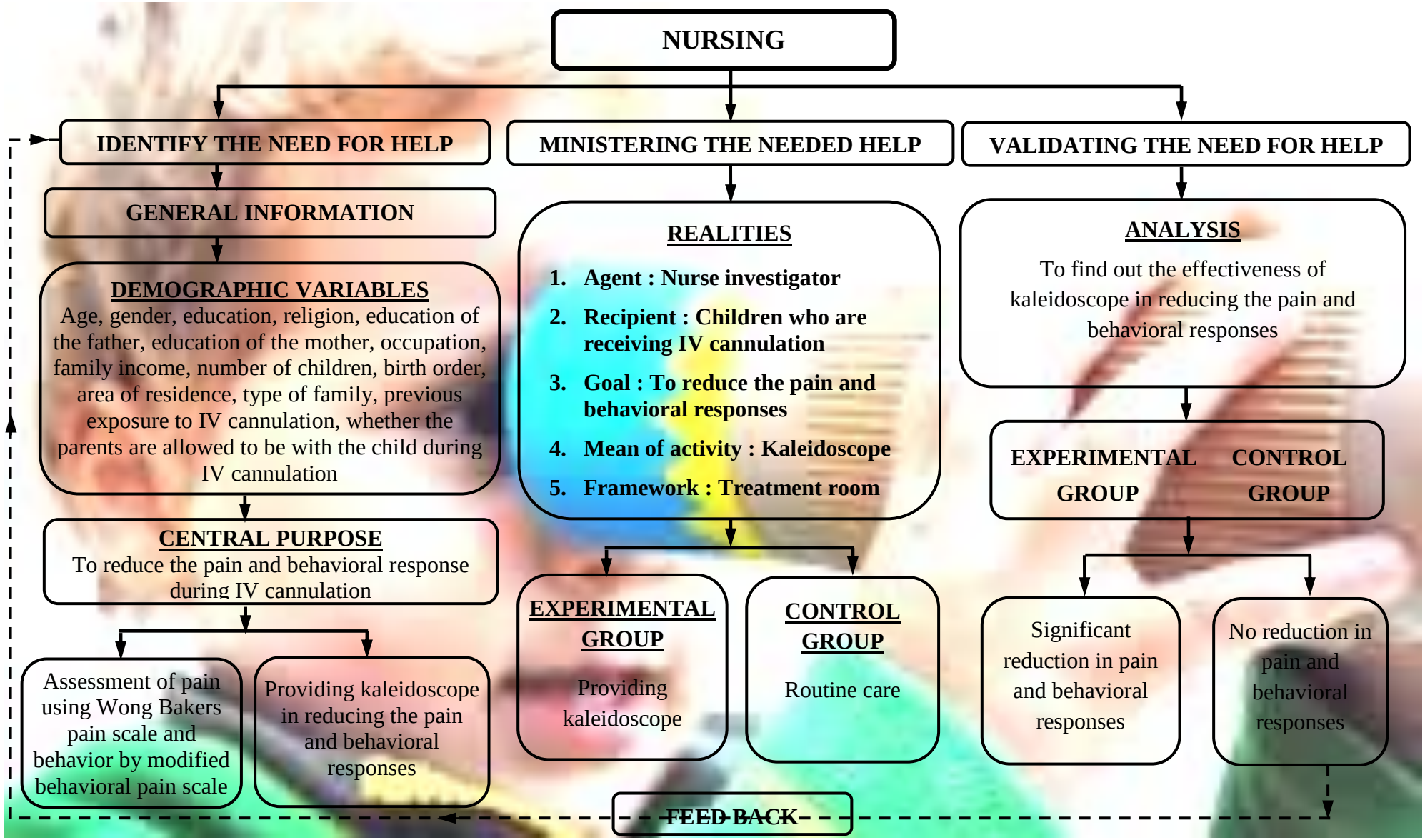


Figure. 1 Modified Conceptual Framework Based on Ernestine Wiedenbach's Helping Art of Clinical Nursing Theory (1964)

CHAPTER - III

Methodology

It is the study which indicates the general pattern of the research approach that includes the steps of procedure and strategies of the data in the investigation.

This chapter explains the methodology adopted by the researcher and it deals with the research approach, research design, setting of the study, population, sample size, sampling technique, criteria for the selection of samples, description of tools, data collection procedure and plan for data analysis.

Research Approach

Quasi-experimental approach, a sub type of quantitative approach was used for the present study.

Research Design

The research design provides an overall plan for conducting the study. Post test only design was adopted for the present study.

E - Experimental group

C - Control group

X - Intervention with kaleidoscope

O_1 - Observation with intervention

O_2 - Observation without intervention

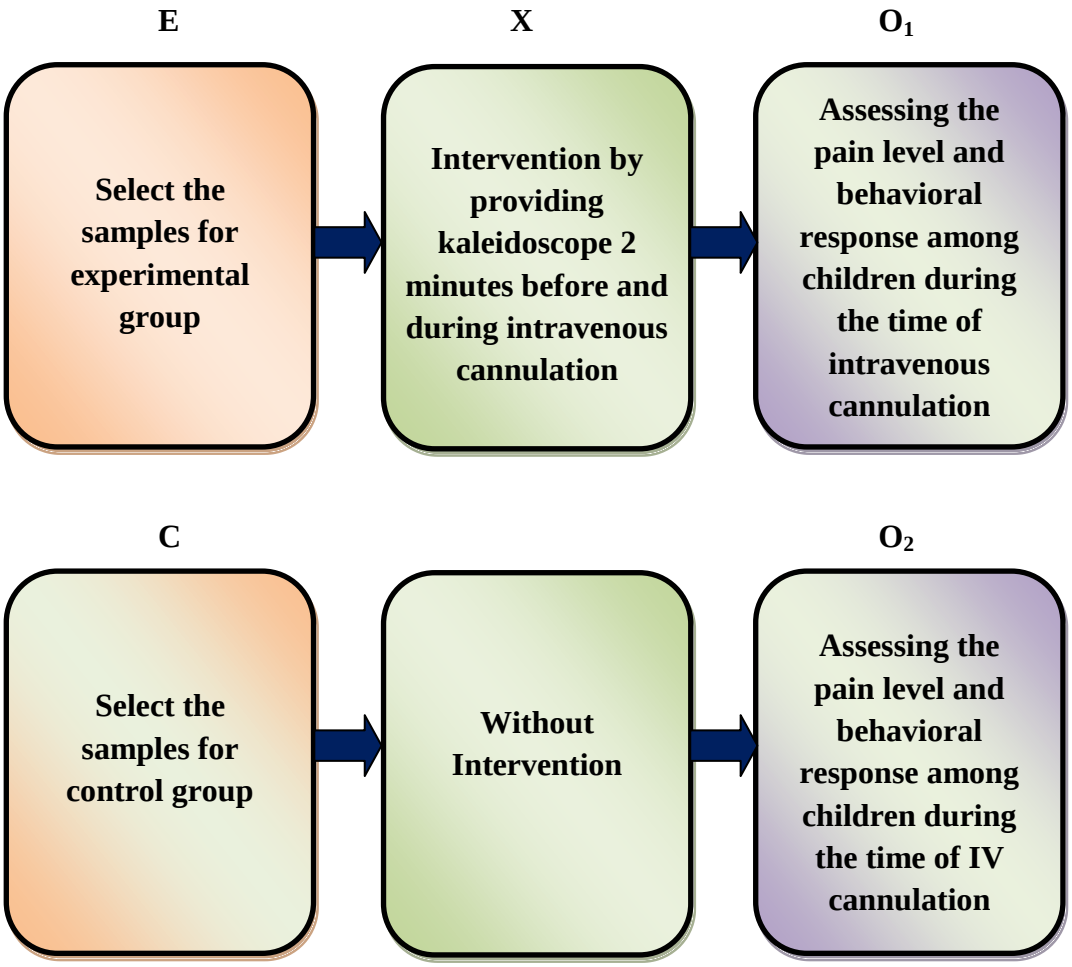


Figure. 2 The Schematic Representation of the Research Design

Setting for the Study

The study was conducted among children between 4-10 years who are admitted in the Masonic hospital, Coimbatore. It is the pediatric specialty hospital situated 20 kms away from our college.

Variables

Independent variable was kaleidoscope and the dependent variable was pain and behavioral response among children undergoing intravenous cannulation. The influencing variables were demographic variables.

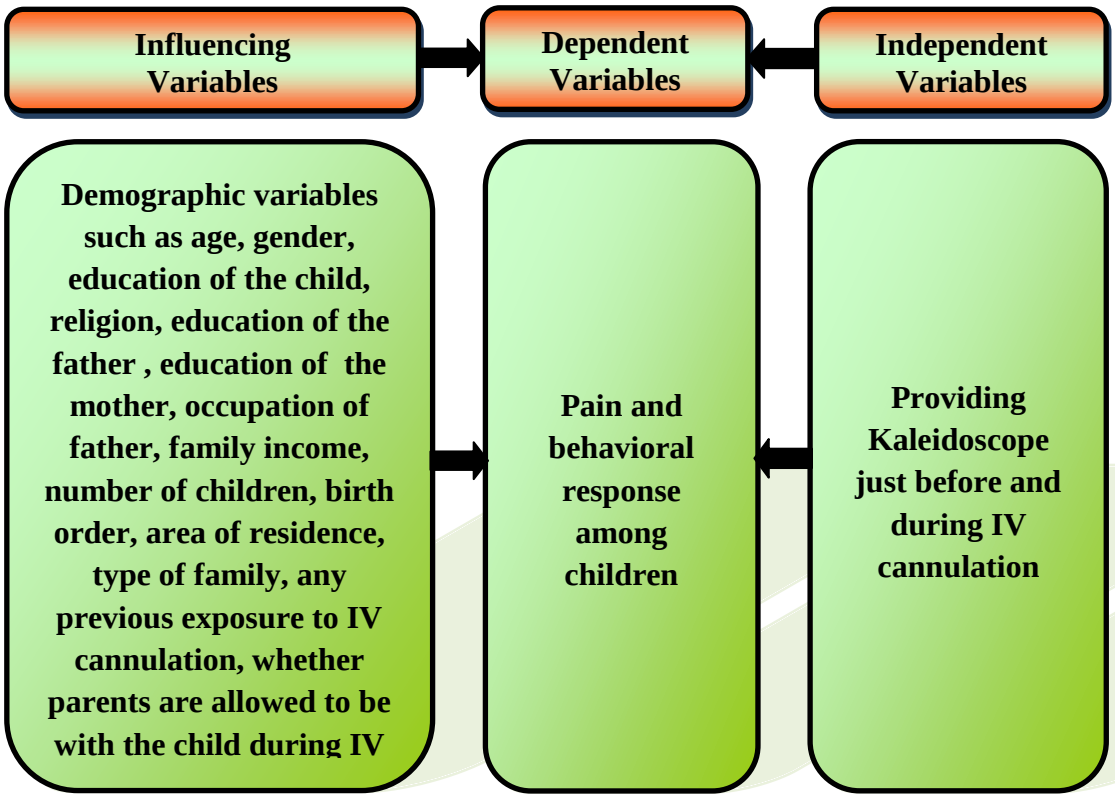


Figure. 3 The Schematic Representation of the Variables

Population

The accessible population includes children between the ages of 4-10 years who receives IV cannulation when admitted in the Masonic hospital, Coimbatore.

Sample Size

The study comprises of 60 samples divided into experimental and control group, each group comprises of 30 samples.

Sampling Technique

Non probability convenient sampling technique was used to select the samples from the population for the present study.

Criteria for Selection of Samples

Inclusive Criteria

- Children admitted in the hospital with in the age group of 4-10 years.
- Children undergoing IV cannulization.
- Whose parents have given consent to participate in this study.

Exclusive Criteria

- Chronically ill child.
- Mentally challenged.
- Children whose parents did not give consent and are not willing to participate in the study.
- Child with sensory problems.

Description of the Tools

The researcher has developed tool after reviewing the literature to assess the pain and behavioral response. It has 3 sections.

Section - A Demographic Variables

The demographic variables include sample number, age in years, gender, education of the child, religion, education of father, education of mother, occupation of the father, family income, number of children in the family, birth order, area of residence, type of family, any previous exposure to IV cannulation, whether parents are allowed to be with the child during IV cannulation.

Section - B Wong Bakers FACES Pain Rating Scale

This scale consist of six faces with six expressions and according to the pain that is how much pain he or she has is noted and rated appropriately.

Face 0 hurts - no pain.

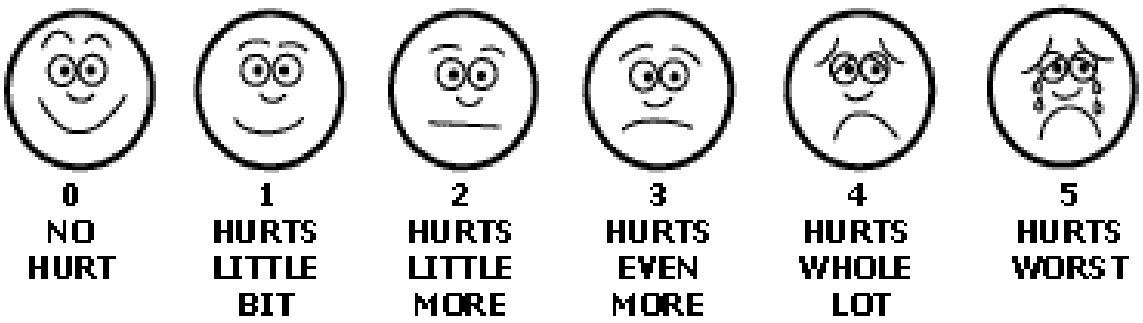
Face 1 hurts - pain little bit.

Face 2 hurts - pain little more.

Face 3 hurts - pain even more.

Face 4 hurts - pain whole lot.

Face 5 hurts - pain worst.



Section - C Modified Behavioral Pain Rating Scale (MBPS)

It is used to assess the behavioral response of the child during intravenous cannulation. Mainly three parameters are used to assess the behavioral response. It includes

- Facial expression
- Cry
- Movements of the child

.

Parameter	Findings	Scoring
Facial expression	Definite positive expression (smiling)	0
	Neutral expression	1
	Slightly negative expression (grimace)	2
	Definite negative expression (furrowed brow eyes closed tightly)	3
Cry	Laughing or giggling	0
	Not crying	1
	Moaning quiet vocalizing gentle or whimpering cry	2
	Full lunged cry	3
	Full lunged cry more than baseline cry	4
Movements	Usual movements and activity	0
	Resting and relaxed	0
	Partial movement (squirming arching limb tensing clenching)	2
	Attempt to avoid the pain by withdrawing the limb	2
	Agitation with complex and general movements	3
	Rigidity	3

Scores	Interpretations
0	Relaxed and comfortable
1 - 3	Mild pain
4 - 6	Moderate pain
7 - 9	Severe pain
10	Very severe

Maximum score was 10 and the minimum score was 0

Testing of the Tool

Content Validity

The tool was given to 6 experts in the field of pediatric nursing and medicine for content validity. All the comments and suggestions given by the experts were duly considered and corrections were made after discussion with research guide.

Reliability

The reliability of the tool was assessed for modified behavioral pain scale by Brown Spearman Split Half Technique showing for pain is + 0.90. This reliability of the tool was satisfactory.

Pilot Study

In order to test the relevance and practicability of the study, a pilot study was conducted among 6 children in Masonic hospital Coimbatore, for a period of one week. The effectiveness of kaleidoscope was assessed by using Wong Bakers faces pain scale and Modified Behavioral pain scale for 6 children, 3 from experimental group and 3 from control group. The result of the pilot study showed that kaleidoscope helped to reduce the pain level and behavioral responses of children during IV cannulation.

Data Collection Procedure

After getting permission from the medical officer, Masonic hospital the researcher met the children coming under inclusive criteria. The purpose of the study was explained to the parents and oral consent was obtained. The study was conducted

for a period of 4 weeks from 1.1.14 to 31.1.14. The 60 samples were selected by using non-probability convenient sampling technique. The number of samples was obtained approximately 2-3 per day and the samples were equally assigned to control and experimental group. The investigator assessed the pain and behavioral response of the child for experimental and control group. For the experimental group kaleidoscope was provided just before and during IV cannulation and then pain and behavioral responses are rated with the scale. Children in control group were in routine procedure during cannulation and pain and behavioral response are rated properly.

Plan for Data Analysis

The investigator adopted descriptive and inferential statistics to analyze the data. The demographic variables were analyzed by using frequency and percentage. The effectiveness of kaleidoscope in reduction of pain and behavioral response was assessed. The association between demographic variables were analyzed by using independent 't' test and 'χ^2' test respectively.

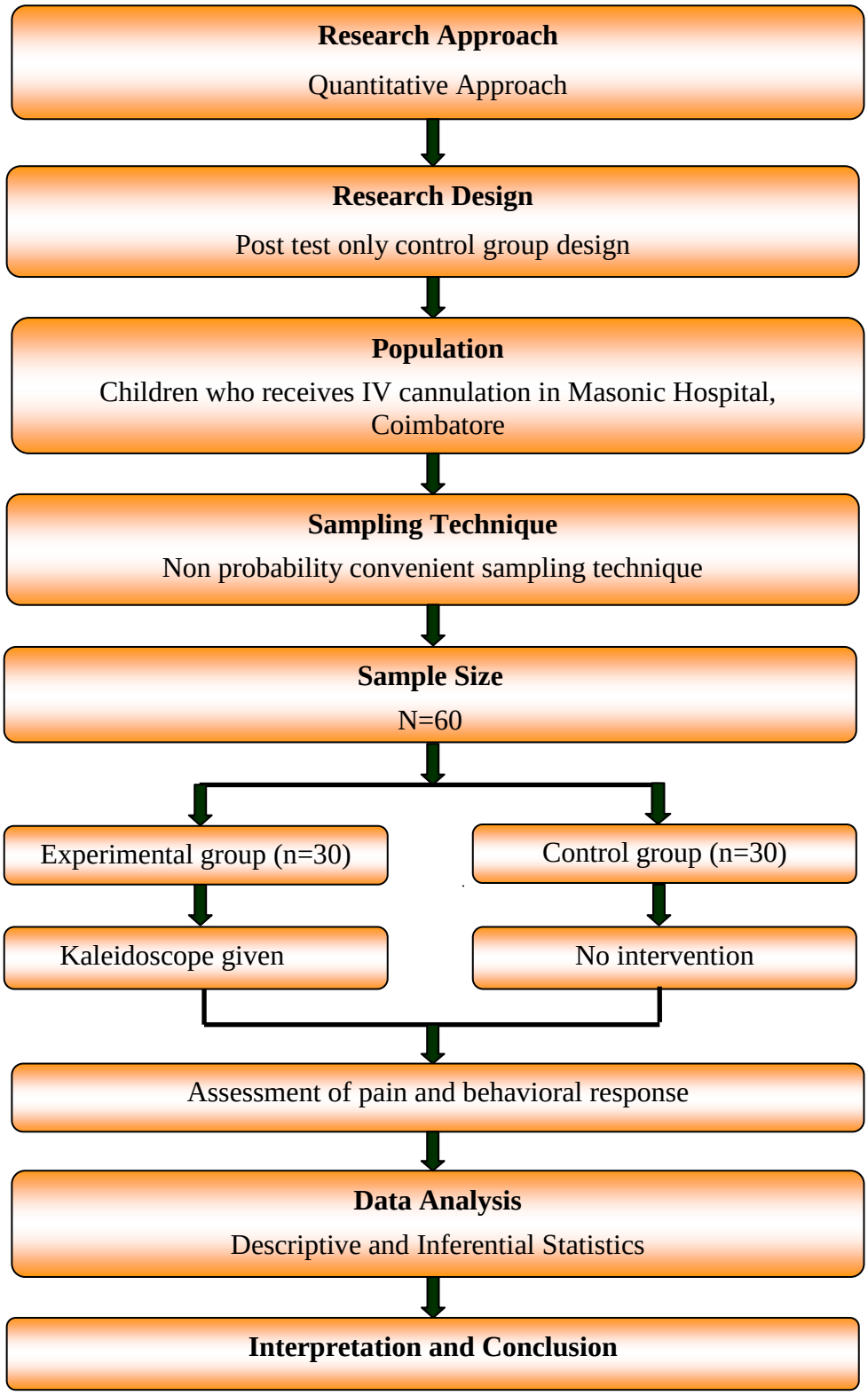


Figure. 4 The Overall View of Research Methodology

CHAPTER - IV

Data Analysis and Interpretation

This chapter deals with analysis and interpretation of the data collected from the children regarding the pain and behavioral responses during IV cannulation in Masonic hospital at Coimbatore.

The findings based on the descriptive and inferential statistical analysis were presented under following headings.

Section - I : Distribution of demographic variables of experimental and control group.

Section – II : (a) Distribution of statistical value of pain scale score of children in experimental and control group regarding pain level during intravenous cannulation.

(b) Comparison of pain level in experimental group and control group according to Wong Bakers faces pain scale.

Section - III : (a) Distribution of statistical values of behavioral response scale score of children in experimental and control group regarding behavioral responses during intravenous cannulation.

(b) Comparison of behavioral response in experimental group and control group according to Modified Behavioral pain scale.

Section - IV : Association of selected demographic variables with post test score of experimental and control group among children.

SECTION - I

Table. 1 Distribution of Demographic Variables of Experimental Group and Control Group Children

(N = 60)

S.No.	Demographic Variables	Experimental Group (n=30)		Control Group (n=30)	
		(f)	**(%)**	**(f)**	**(%)**
1.	**Age of the child**				
	a) 4 – 6 years	16	53	14	47
	b) 6 – 8 years	6	20	9	30
	c) 8 –10 years	8	27	7	23
2.	**Gender**				
	a) Male	12	40	14	47
	b) Female	18	60	16	53
3.	**Education of a child**				
	a) Primary	12	40	11	37
	b) 1 – 3rd std	11	37	10	33
	c) 4 – 5th std	7	23	9	30
4.	**Religion**				
	a) Hindu	22	73	20	67
	b) Christian	8	27	7	23
	c) Muslim	0	0	3	10
5.	**Education of the father**				
	a) Illiterate	1	3	0	-
	b) Primary	11	37	6	20
	c) Higher secondary	6	20	8	27
	d) Graduate	12	40	16	53

(Table 1 continued)

(Table 1 continues)

S.No.	Demographic Variables	Experimental Group (n=30)		Control Group (n=30)	
		(f)	(%)	(f)	(%)
6.	**Education of the mother**				
	a) Illiterate	1	3	2	7
	b) Primary	7	23	3	10
	c) Higher secondary	8	27	7	23
	d) Graduate	14	47	18	60
7.	**Occupation of the father**				
	a) Government	7	23	11	37
	b) Private	9	30	9	30
	c) Business	11	37	9	30
	d) Coolie	3	10	1	3
8.	**Family income**				
	a) Below ₹. 5000	1	3	1	3
	b) ₹. 5001 - 10,000	8	27	1	3
	c) ₹. 10,001 - 20,000	12	40	11	37
	d) ₹. 20,001 and above	9	30	17	57
9.	**Number of children**				
	a) 1	8	27	12	41
	b) 2	17	57	13	43
	c) 3	5	16	5	16

(Table 1 continued)

(Table 1 continues)

S.No.	Demographic Variables	Experimental Group (n=30)		Control Group (n=30)	
		(f)	(%)	(f)	(%)
10.	**Birth order**				
	a) 1	13	43	19	63.3
	b) 2	16	54	6	20
	c) 3	1	3	5	16.7
11.	**Area of residence**				
	a) Urban	21	70	15	50
	b) Rural	9	30	15	50
12.	**Type of family**				
	a) Joint	15	50	11	37
	b) Nuclear	15	50	19	63
13.	**Any previous exposure to IV cannulation**				
	a) Yes	9	30	12	40
	b) No	21	70	18	60
14.	**Whether parents are allowed to be with the child during IV cannulation**				
	a) Yes	10	33	5	16
	b) No	20	67	25	84

Table 1 shows Distribution of Demographic Variables in Experimental group and control group.

- Among the respondents in experimental group, 16(53%) were between age group of 4 -6 years, 6(20%) were between age group of 6-8 years and 8(27%) were in the age group of 8-10 years.
- Among the respondents in control group, 14(47%) were between age group of 4-6 years, 9(30%) were between age group of 6-8 years, 7(23%) were in the age group of 8-10 years.
- Regarding sex in experimental group, 12(40%) were male and 18(60%) were females.
- Regarding sex in control group, 14(47%) were male and 16(53%) were females.
- With regard to education of a child in experimental group, 12(40%) were primary, 11(37%) are studying in 1-3rd standard 7(23%) were studying in 4-5th standard.
- With regard to education in control group, 11(37%) were primary, 10(33%) were studying in 1-3rd standard, 9(30%) were studying in 4-5th standard.
- With regard to the religion in the experimental group, 22(73%) were Hindu's, 8(27%) were Christian's.
- With regard to the religion in the control group, 20(67%) were Hindu's, 7(23%) were Christian's, and 3(10%) were Muslim.
- With regard to education of the father in experimental group, 1(3%) were illiterate, 11(37%) were primary, 6(20%) were higher secondary, 12(40%) were graduates or above.
- With regard to education of the father in control group, 6(20%) were primary, 8(27%) were higher secondary, 16(53%) were graduates or above.

- With regard to education of the mother in experimental group, 1(3%) were illiterate, 7(23%) were primary, 8(27%) were higher secondary, 14(47%) were graduates or above.
- With regard to education of the mother in control group, 2(7%) were illiterate, 3(10%) were primary, 7(23%) were higher secondary and 18(60%) were graduates or above.
- In consideration of the occupation of the father in experimental group, 7(23%) were government employees, 9(30%) were private employees, 11(37%) were business and 3(10%) were coolie's.
- In consideration of the occupation of the father in control group, 11(37%) were government employees, 9(30%) were private employees, 9(30%) were business and 1(3%) were coolies.
- With regard to total family income per month in experimental group, 1(3%) were less than ₹. 5000, 8(27%) were ₹. 5001-10,000, 12(40%) were ₹. 10,001-20,000 and 9(30%) were belongs to a group of ₹. 20,001 and above.
- With regard to total family income per month in control group, 1(3%) were below ₹. 5000, 1(3%) were ₹. 5001-10,000, 11(37%) were ₹. 10,001-20,000 and 17(57%) were belongs to a group of ₹. 20,001 and above.
- With regard to number of children in a family in experimental group, 19(63%) have one child and 6(20%) have two child, 5(14) were ≥ to three child.
- With regard to number of children in a family in control group, 12(40%) have one child, 13(43%) have two child and 5(16%) have ≥ to three child.
- Based on the birth order in experimental group, 13(43%) were first order, 16(54%) were second order and 1(3%) were third order.

- Based on the birth order in control group, 19(63%) were first order, 6(20%) were second order and 5(17%) were third order.
- Regarding area of residence in experimental group, 21(70%) were urban and 9(30%) were lived in rural area.
- Regarding area of residence in control group, 15(50%) were urban and 15(50%) were lived in rural area.
- About the type of family in experimental group, 15(50%) were nuclear family and 15(50%) were joint family.
- About the type of family in control group, 11(37%) were nuclear family and 19(63%) were joint family.
- Regarding the previous exposure to IV cannulation in experimental group, 9(30%) were had previous experience and 21(70%) had no previous experience.
- Regarding the previous exposure to IV cannulation in the control group, 12(40%) were had previous experience and 18(60%) had no previous experience.
- Based on the parents are allowed to be with the child during IV cannulation in experimental group, 10(33%) were allowed and 20(67%) had no previous experience.
- Based on the parents are allowed to be with the child during IV cannulation in control group, 5(16%) were allowed and 25(84%) were not allowed.

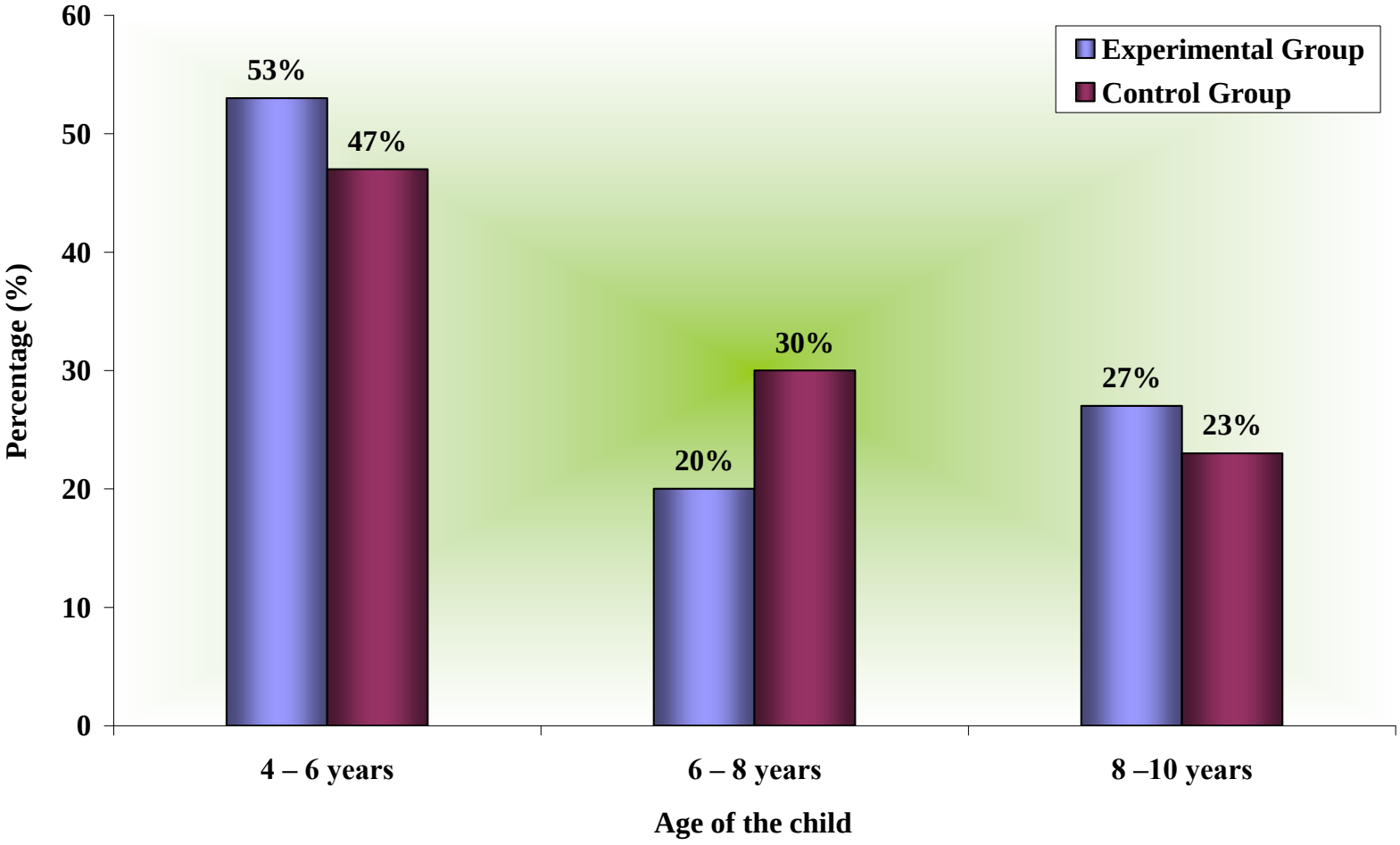


Figure. 5 Distribution of Demographic Variables According to the Age of the Child

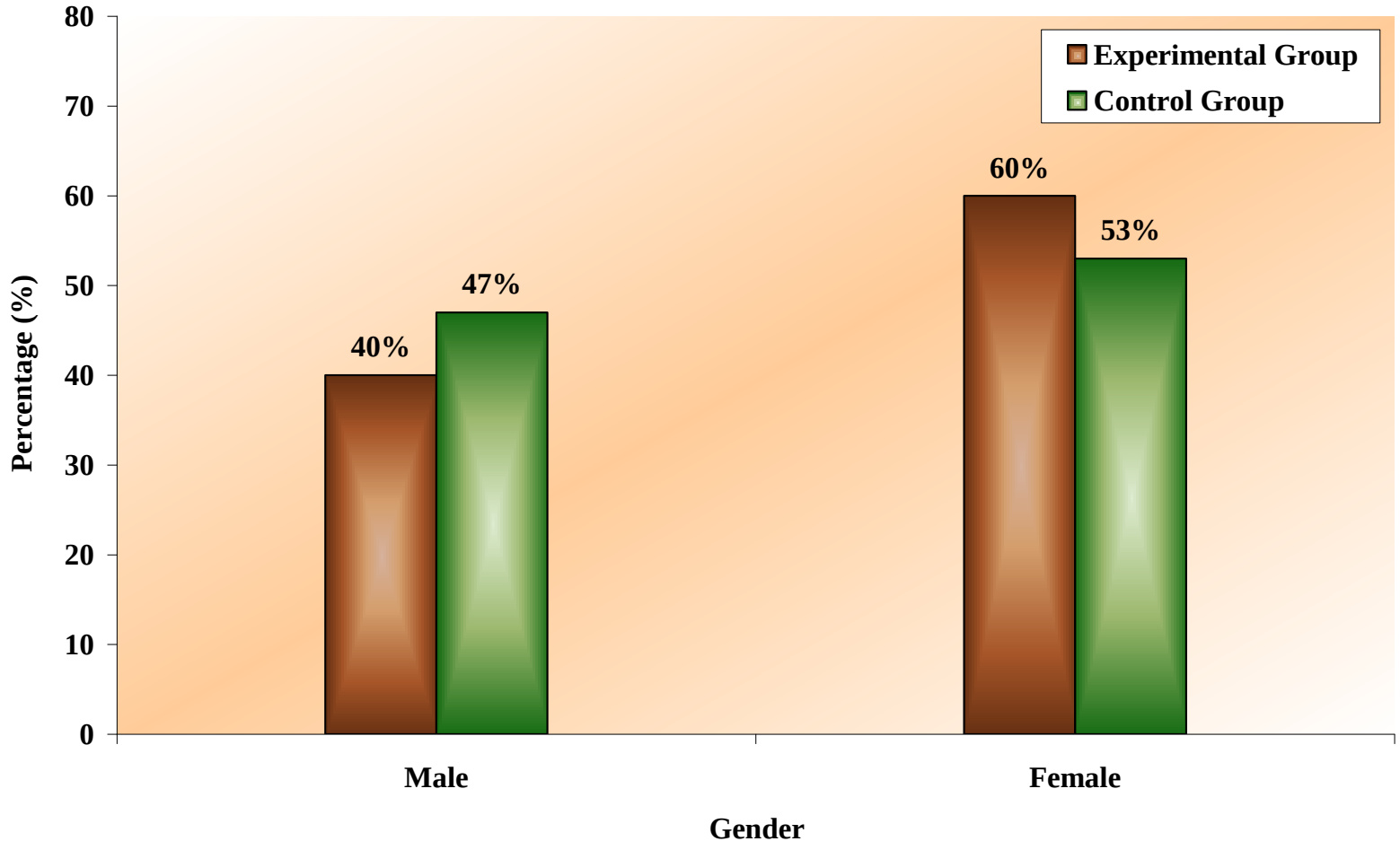


Figure. 6 Distribution of Demographic Variables According to Gender

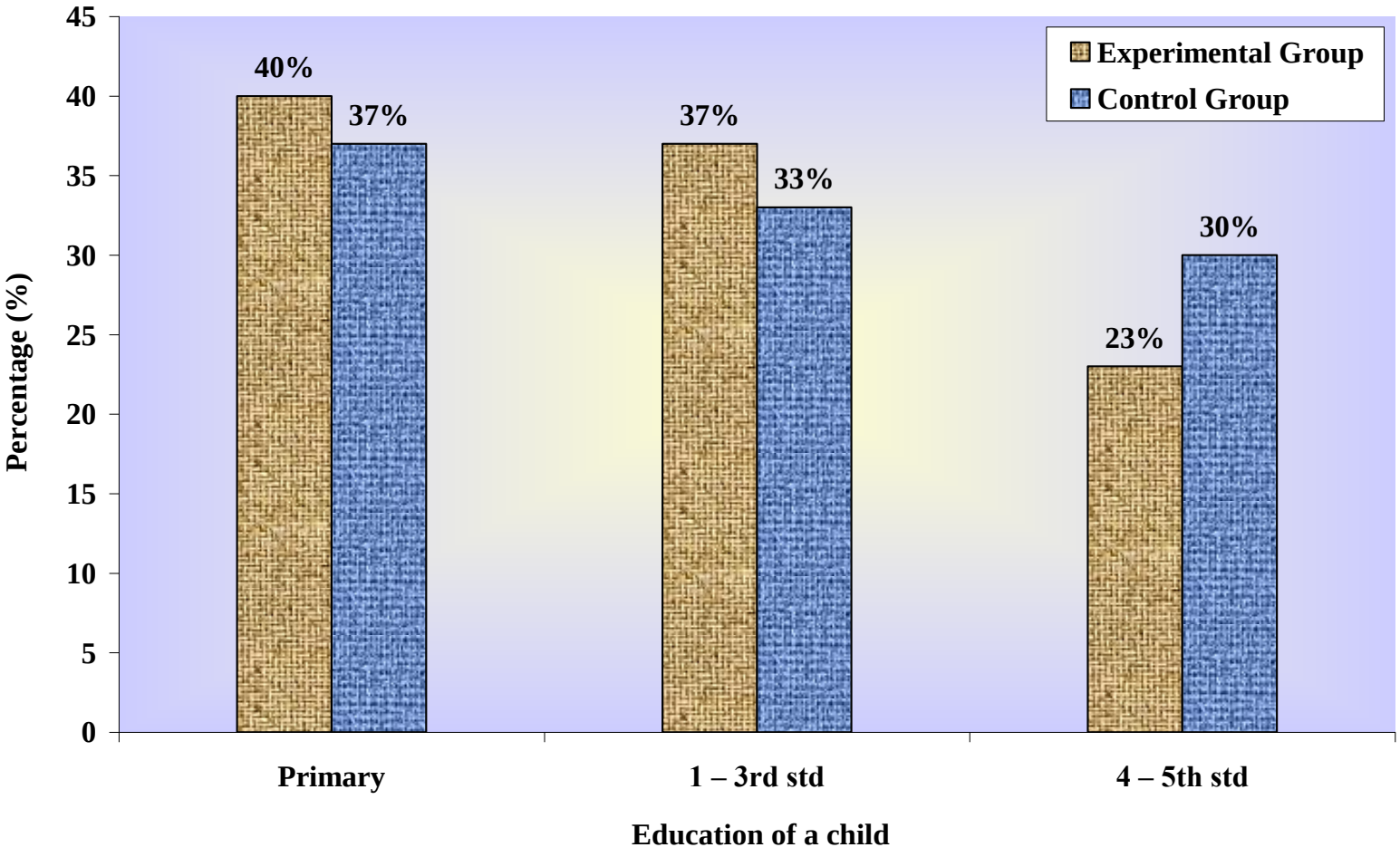


Figure. 7 Distribution of the Demographic Variables According to Education of the Child

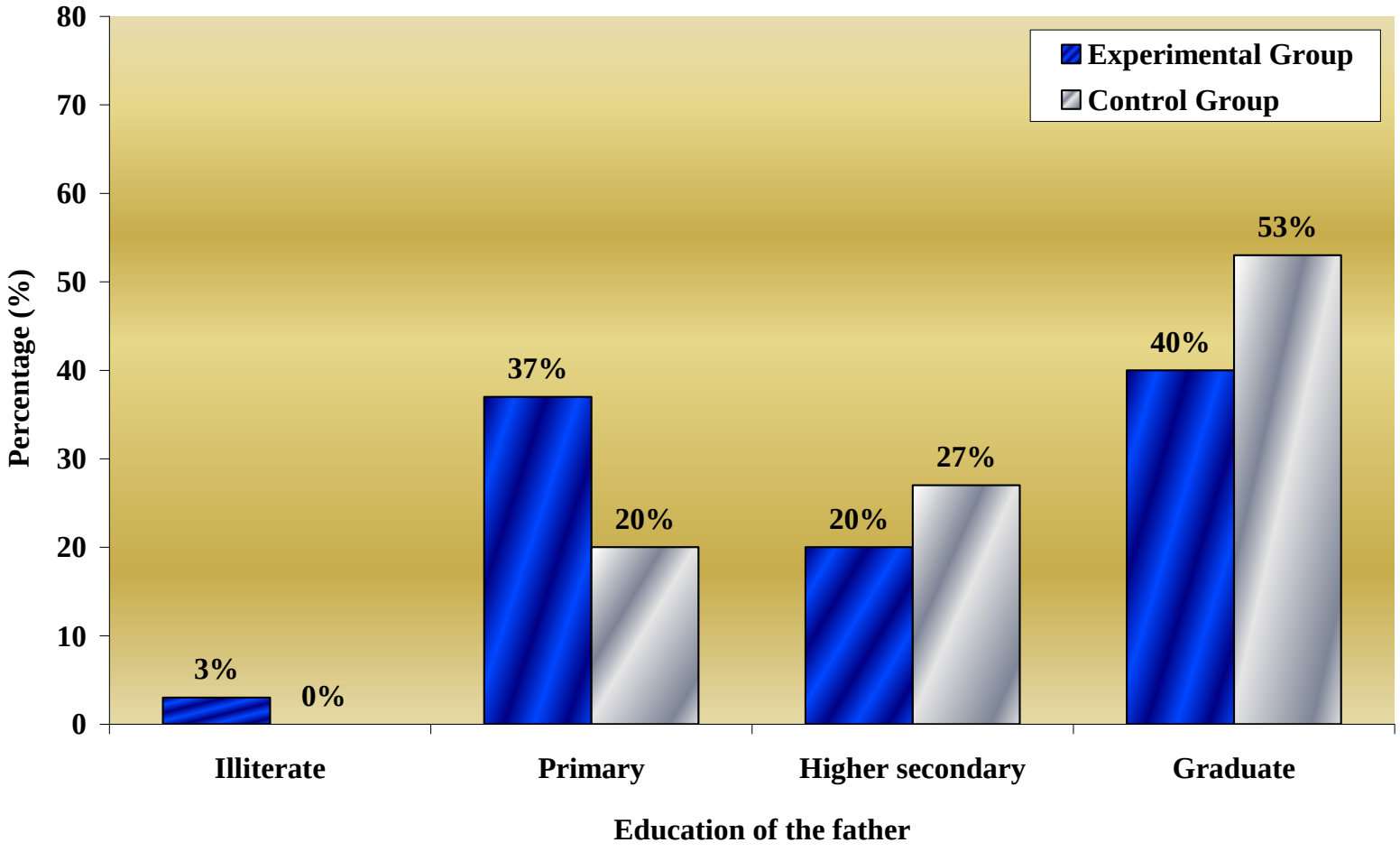


Figure. 8 Distribution of Demographic Variables According to Education of the Father

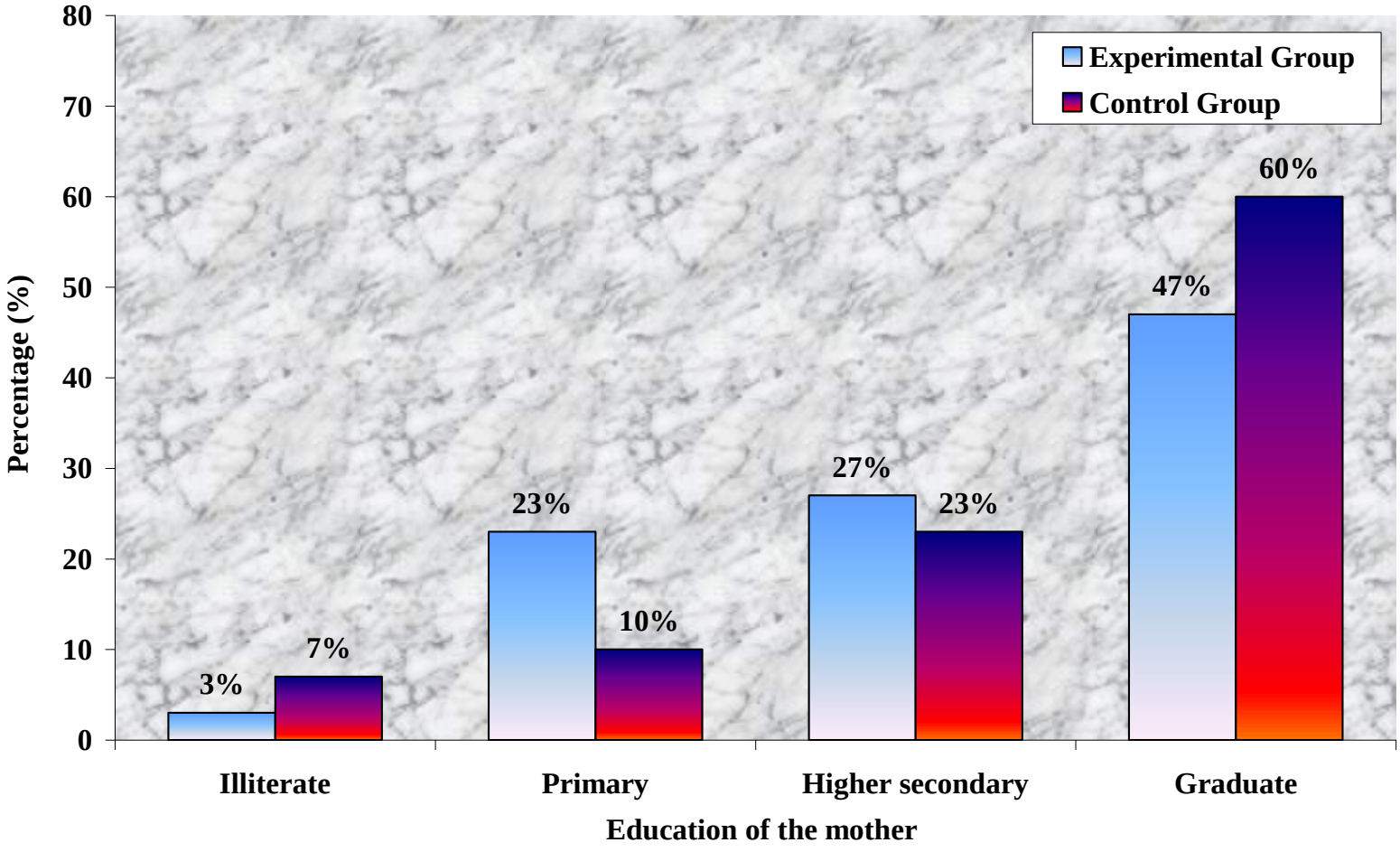


Figure. 9 Distribution of Demographic Variables According to Education of the Mother

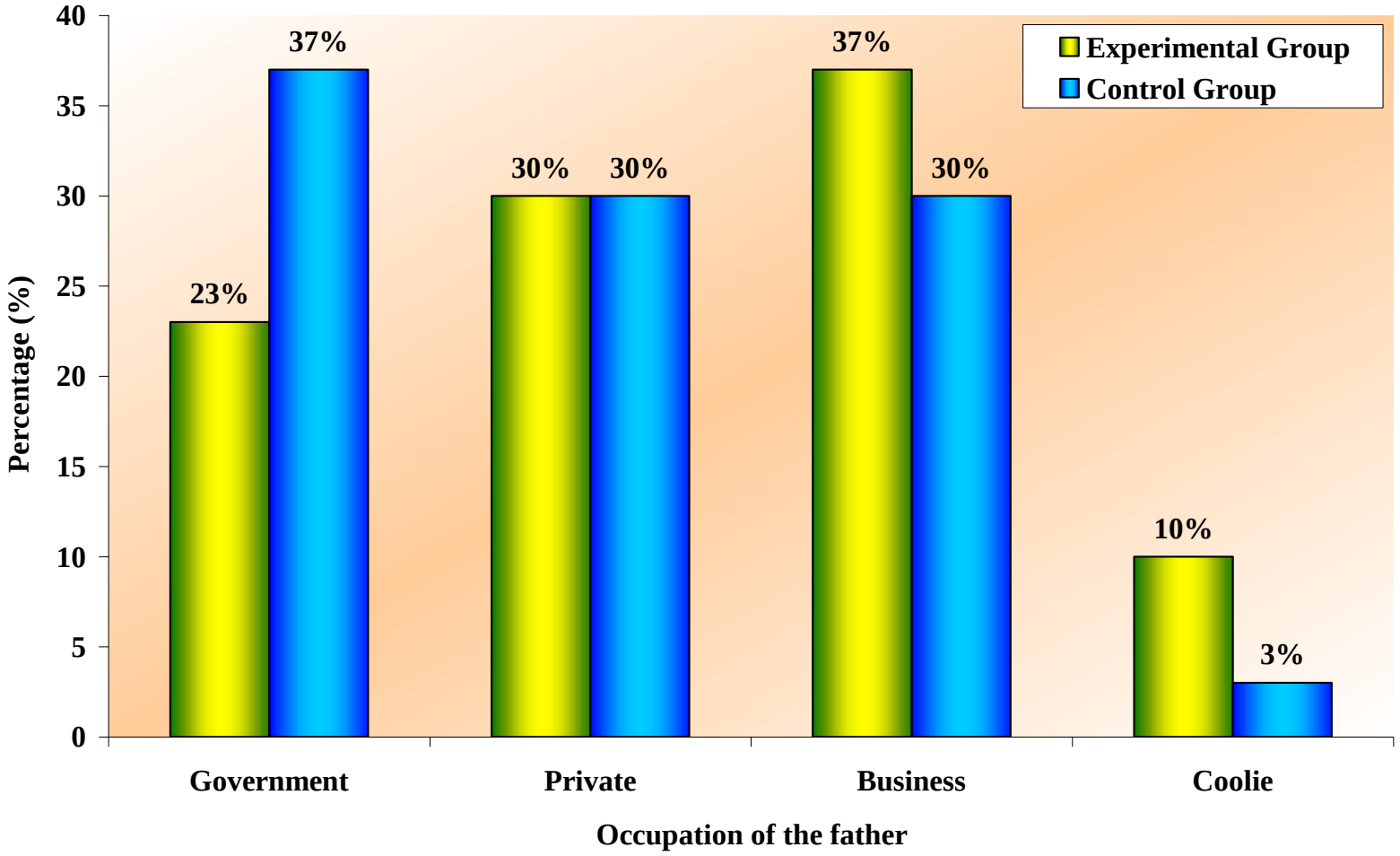


Figure. 10 Distribution of Demographic Variables According to Occupation of the Father

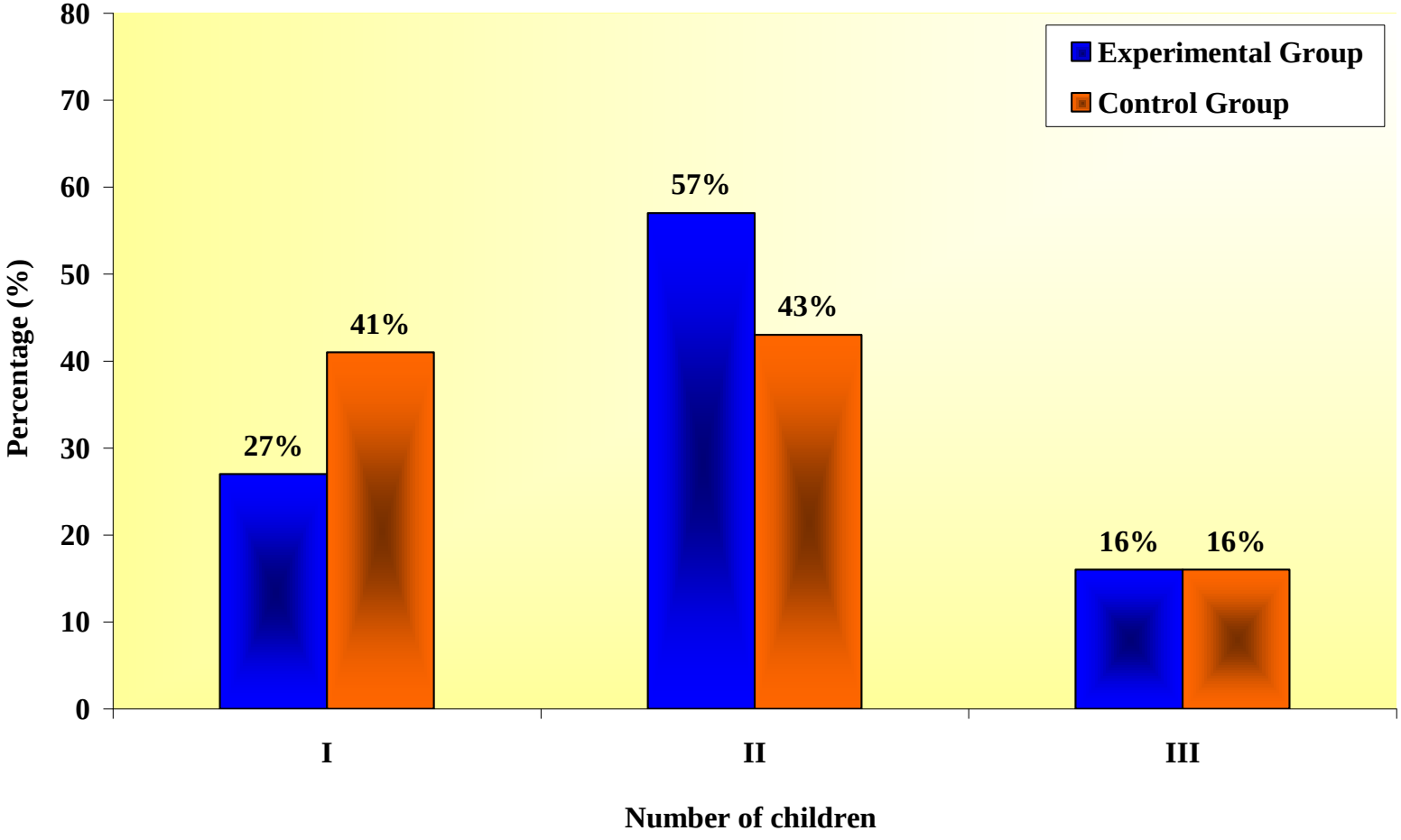


Figure. 11 Distribution of Demographic Variables According to Number of Children in the Family

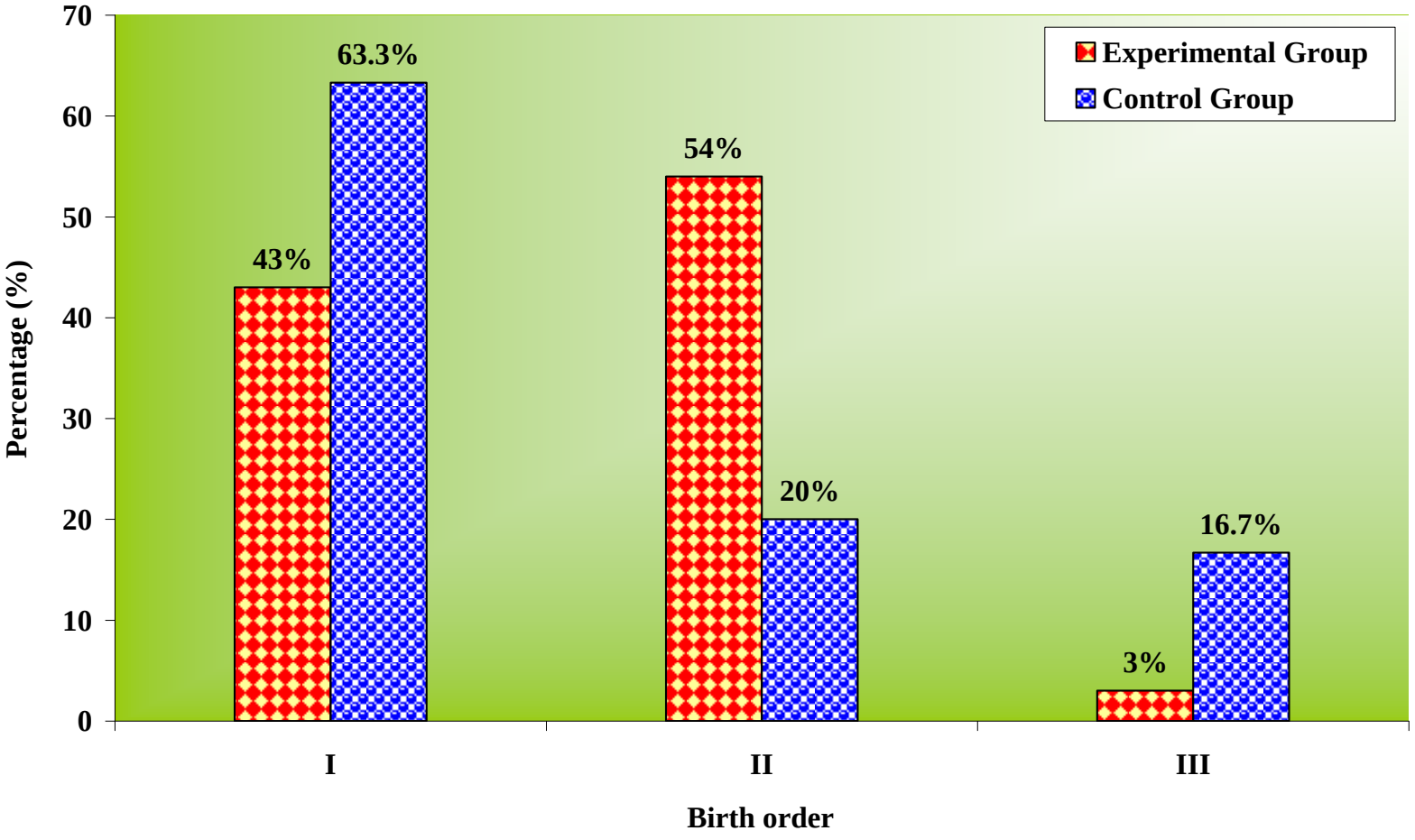


Figure. 12 Distribution of the Demographic Variables According to Birth Order

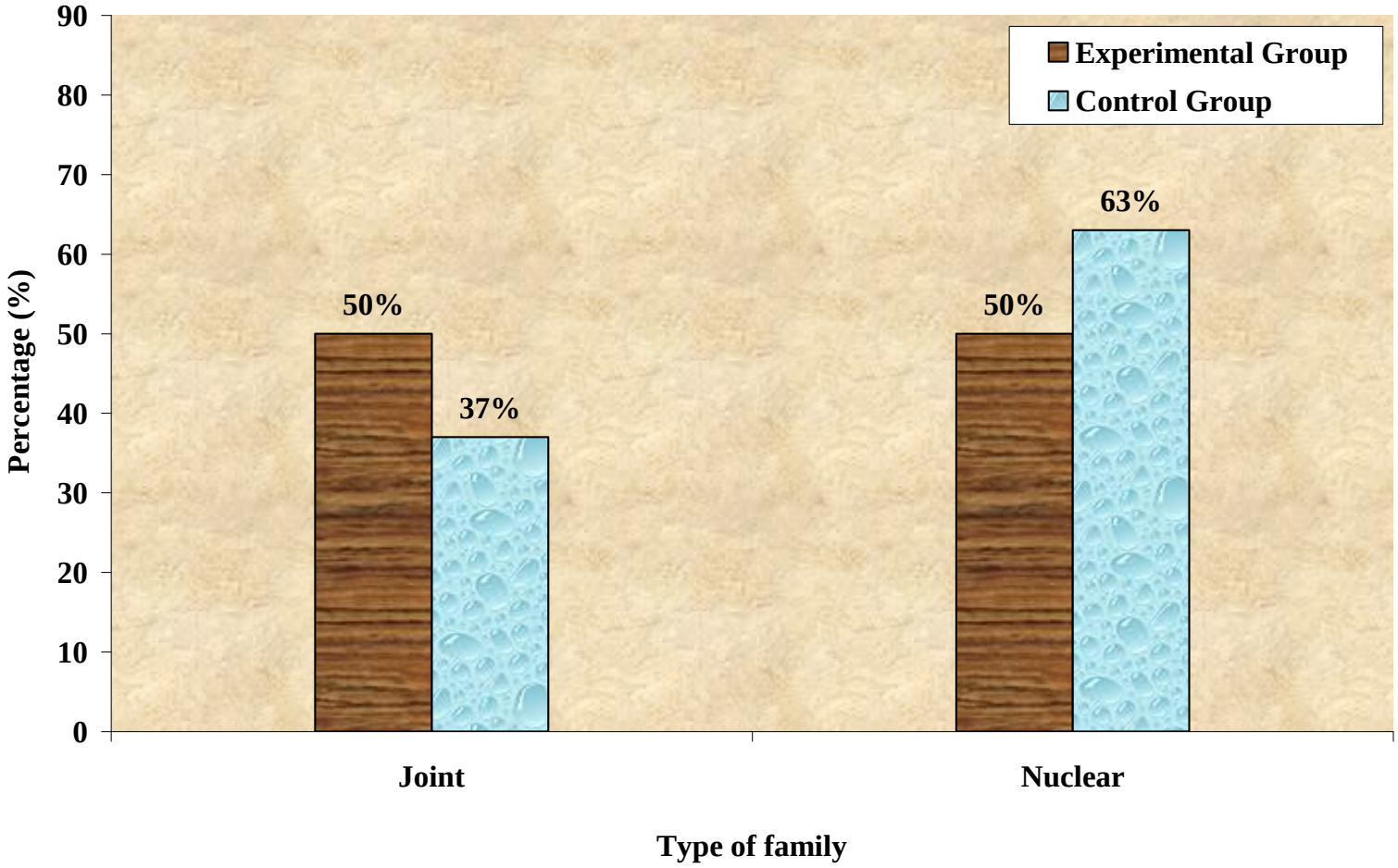


Figure. 13 Distribution of Demographic Variables According to Type of Family

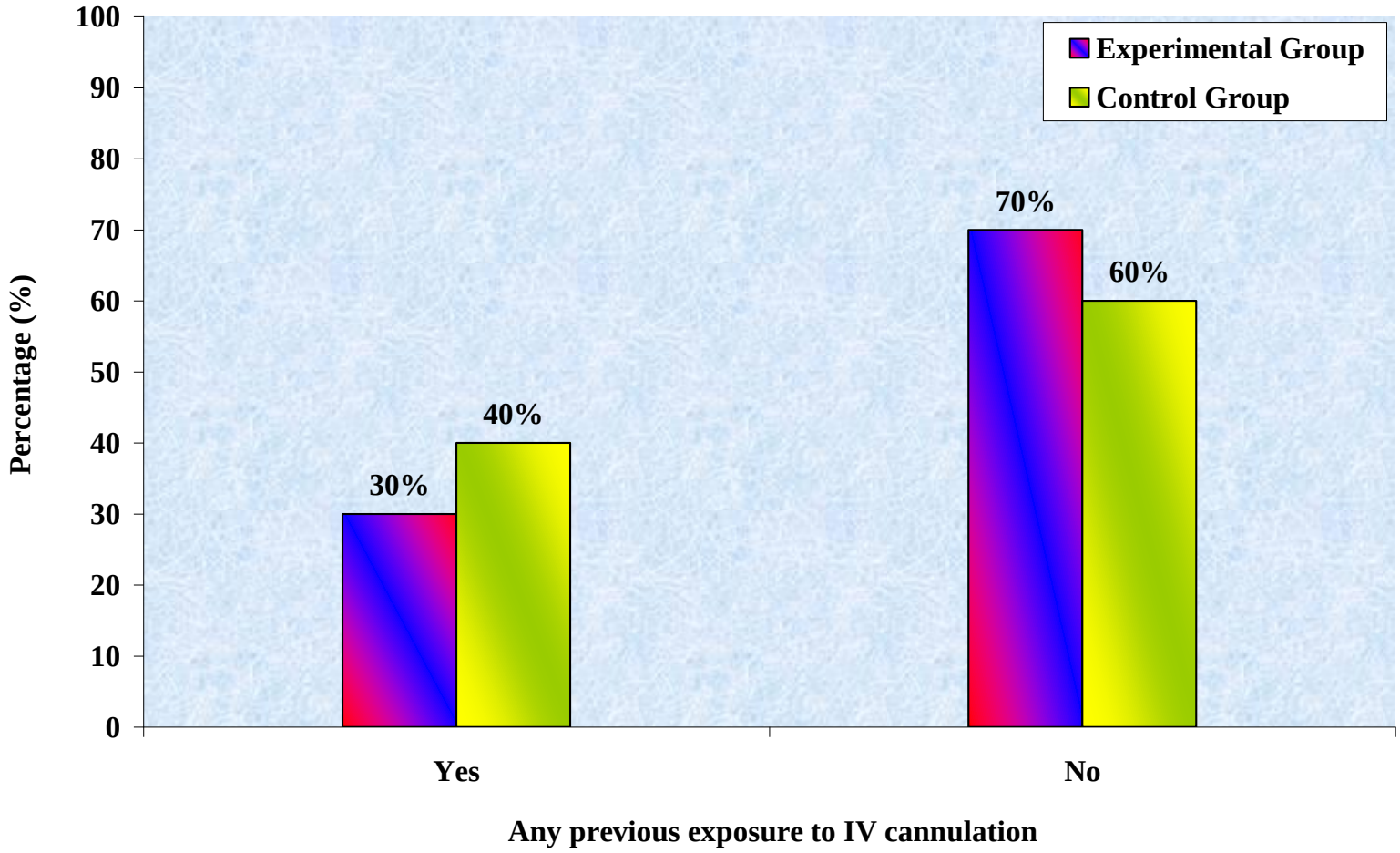


Figure. 14 Distribution of Demographic Variables According to Any Previous Exposure to IV Cannulation

SECTION - II

Table. 2 Distribution of Statistical Value of Post Test Mean Score for Experimental and Control Group Regarding the Pain and Behavioral Response Among Children During IV Cannulation

(N = 60)

S.No.	Group	Pain Mean Score	Behavioural Response Mean Score
1.	Experimental group	1.6	3.43
2.	Control group	4.3	8.6

Table 2 shows there is a remarkable difference in the mean pain score and behavioral score of experimental and control group. Experimental group perceives less pain and behavioral responses when compared to the control group.

Table. 3 Distribution of Statistical Value of Post Test Score for Experimental and Control Group Regarding Pain Among Children During Cannulation

(N = 60)

S.No.	Pain Level	Mean	SD	't' value
1.	Experimental group	1.6	0.95	3.91*
2.	Control group	4.3	0.69	

*significant at 0.05 level

Table 3 shows that the table value of t=1.67 at 0.05, calculated value of t=3.91 at p=0.05, which is greater than the expected table value. This shows that kaleidoscope has significant effect on pain among children during IV cannulation.

Table. 4 Distribution of Statistical Value of Post Test Score for Experimental and Control Group Regarding Behavioral Responses Due to Pain Among Children During IV Cannulation

(N = 60)

S. No.	Behavioural Responses	Mean	SD	't' value
1.	Experimental group	3.43	1.40	14.71*
2.	Control group	8.6	1.26	

*significant at 0.05 level

Table 4 shows that the table value of t=1.67 at 0.05, calculated value of t=14.71 at p=0.05, which is greater than the expected table value. This shows that kaleidoscope has significant effect on behavioral responses among children during IV cannulation.

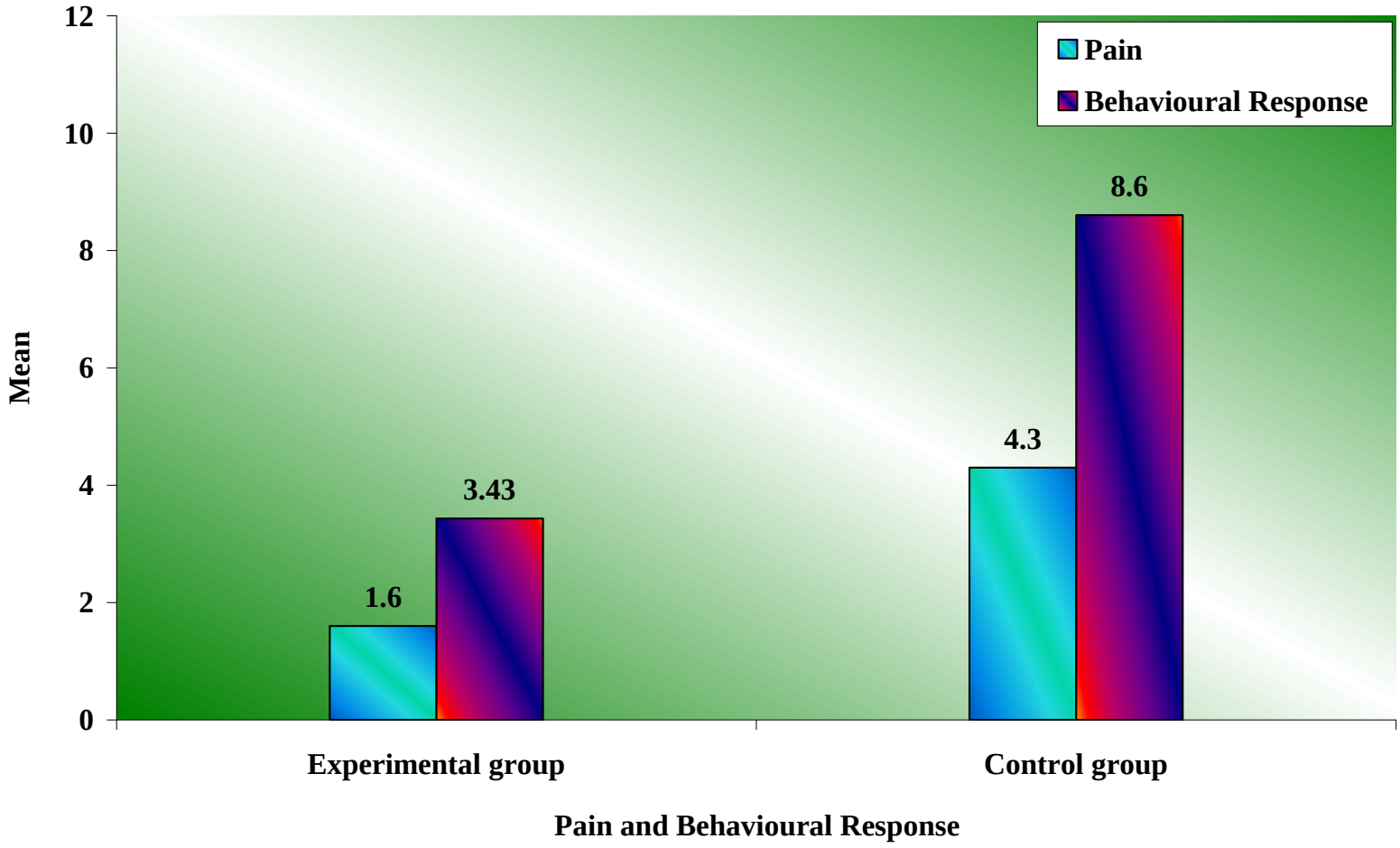


Figure. 15 Distribution of Post Test Mean Score for Experimental and Control Group Regarding the Pain and Behavioral Response During IV Cannulation

SECTION - III

Table. 5 Comparison of Pain Level in Experimental Group and Control Group According to Wong Bakers Faces Pain Scale

(N = 60)

Pain level	No Hurt		Hurts Little Bit		Hurts little More		Hurts Even More		Hurts Whole Lot		Hurts Worst	
	f	%	f	%	f	%	f	%	f	%	f	%
Experimental Group	3	10	12	40	10	33.4	4	13.3	1	3.3	-	-
Control group	-	-	-	-	-	-	4	13.3	12	40	14	46.7

Table 5 shows that pain level in experimental group 3(10%) were no hurt, 12(40%) were hurt little bit, 10(33.4%) were hurt little more, 4(13.3%) were hurt even more, 1(3.3%) were hurt whole lot. Pain level in control group 4(13.3%) were hurt even more, 12(40%) were hurt whole lot 14(46.7%) were hurt worst.

Table. 6 Comparison of Behavioral Responses in Experimental Group and Control Group According to Modified Behavioral Pain Scale

(N = 60)

Behavioural Response	No Pain		Mild Pain		Moderate Pain		Severe Pain		Very Severe	
	f	%	f	%	f	%	f	%	f	%
Experimental group	-	-	16	53.3	14	46.7	-	-	-	-
Control group		-		-	2	6.7	17	56.7	11	36.6

Table 6 shows that behavioral responses in experimental group 16(53.3%) have mild pain, 14(46.7%) have moderate pain. Behavioral responses in the control group 2(6.7%) have moderate pain, 17(56.7%) have severe pain, 11(36.6%) have very severe pain.

SECTION - IV

Table. 7 Association of Selected Demographic Variables with Post Test Pain Scale Score of Experimental Group Among Children

(n = 30)

S.No.	Demographic Variables	Above Mean	Below Mean	χ^2
1.	**Age of the child**			
	a) 4 – 6 years	7	9	
	b) 6 – 8 years	3	3	0.75
	c) 8 –10 years	5	3	
2.	**Gender**			
	a) Male	5	7	0.52
	b) Female	10	8	
3.	**Education of the child**			
	a) Primary	6	6	
	b) 1 – 3 rd std	4	7	2.102
	c) 4 – 5th std	5	2	
4.	**Religion**			
	a) Hindu	11	11	
	b) Christian	4	4	0
	c) Muslim	-	-	
5.	**Education of the father**			
	a) Illiterate	1	0	
	b) Primary	3	8	6.38
	c) Higher secondary	5	1	
	d) Graduate	6	6	

(Table 7 continued)

(Table 7 continues)

S.No.	Demographic Variables	Above Mean	Below Mean	χ^2
6.	**Education of the mother**			
	a) Illiterate	0	1	
	b) Primary	4	3	1.92
	c) Higher secondary	3	5	
	d) Graduate	8	6	
7.	**Occupation of the father**			
	a) Government	3	4	
	b) Private	7	2	4.022
	c) Business	4	7	
	d) Coolie	1	2	
8.	**Family income**			
	a) Below ₹. 5000	1	0	
	b) ₹. 5001-10,000	2	6	4.13
	c) ₹. 10,001 - 20,000	8	4	
	d) ₹. 20,001 and above	4	5	
9.	**Number of children in the family**			
	a) 1	4	4	
	b) 2	9	8	0.258
	c) 3 and above	2	3	
10.	**Birth order**			
	a) 1	8	5	
	b) 2	6	10	2.68
	c) 3	1	0	
11.	**Area of residence**			
	a) Urban	11	10	
	b) Rural	4	5	0.151

(Table 7 continued)

(Table 7 continues)

S.No.	Demographic Variables	Above Mean	Below Mean	χ^2
12.	**Type of family**			
	a) Joint	11	4	
	b) Nuclear	4	11	6.52*
13.	**Any previous exposure to IV cannulation**			
	a) Yes	5	4	
	b) No	10	11	0.146
14.	**Whether parents are allowed to be with the child during IV cannulation**			
	a) Yes	6	4	0.6
	b) No	9	11	

* Significant

Table 7 shows the association of post test scores of pain score during IV cannulation in experimental group children with selected demographic variables by χ^2. Among the demographic variable like type of family is associated with the post test score. The demographic variable like age of the child, gender, education of the child, religion, education of the father, education of the mother, occupation of the father, family income, number of children in the family, birth order, area of residence, previous exposure to IV cannulation, whether the parents are allowed to be with the child during IV cannulation were not associated with post test score among control group children in calculated values.

Table. 8 Association of Selected Demographic Variables with Post Test Pain Scale Score of Control Group Among Children

(n = 30)

S.No.	Demographic Variables	Above Mean	Below Mean	χ^2
1.	**Age of the child**			
	a) 4 – 6 years	9	5	
	b) 6 – 8 years	3	6	3.30
	c) 8 –10 years	2	5	
2.	**Gender**			
	a) Male	10	4	6.45*
	b) Female	4	12	
3.	**Education of the child**			
	a) Primary	7	4	
	b) 1 – 3 rd std	5	5	3.475
	c) 4 – 5th std	2	7	
4.	**Religion**			
	a) Hindu	10	10	
	b) Christian	3	4	0.341
	c) Muslim	1	2	
5.	**Education of the father**			
	a) Illiterate	0	0	
	b) Primary	3	3	
	c) Higher secondary	5	3	1.363
	d) Graduate	6	10	

(Table 8 continued)

(Table 8 continues)

S.No.	Demographic Variables	Above Mean	Below Mean	χ^2
6.	**Education of the mother**			
	a) Illiterate	0	2	
	b) Primary	2	1	4.416
	c) Higher secondary	5	2	
	d) Graduate	7	11	
7.	**Occupation of the father**			
	a) Government	4	7	
	b) Private	5	4	
	c) Business	5	4	1.433
	d) Coolie	0	1	
8.	**Family income**			
	a) Below ₹. 5000	0	1	
	b) ₹. 5001-10,000	1	0	
	c) ₹. 10,001 - 20,000	6	5	2.247
	d) ₹. 20,001 and above	7	10	
9.	**Number of children in the family**			
	a) 1	8	4	
	b) 2	4	9	3.344
	c) 3 and above	2	3	
10.	**Birth order**			
	a) 1	10	9	
	b) 2	3	3	1.721
	c) 3	1	4	

(Table 8 continued)

(Table 8 continues)

S.No.	Demographic Variables	Above Mean	Below Mean	χ^2
11.	**Area of residence**			
	a) Urban	5	10	2.14
	b) Rural	9	6	
12.	**Type of family**			
	a) Joint	5	6	0.0094
	b) Nuclear	9	10	
13.	**Any previous exposure to IV cannulation**			
	a) Yes	5	7	0.195
	b) No	9	9	
14.	**Whether parents are allowed to be with the child during IV cannulation**			
	a) Yes	2	3	0.08
	b) No	12	13	

* significance

Table 8 shows the association of post test scores of pain during IV cannulation in control group children with selected demographic variables by χ^2. Among the demographic variables gender is associated with post test score. The demographic variable like age of the child, education of the child, religion, education of the father, education of the mother, occupation of the father, family income, number of children in the family, birth order, area of residence, type of family, previous exposure to IV cannulation, whether the parents are allowed to be with the child during IV cannulation were not associated with post test score among control group children in calculated values.

Table. 9 Association of Selected Demographic Variables with Post Test Behavioral Response Scale Score of Experimental Group Among Children

(n = 30)

S.No.	Demographic Variables	Above Mean	Below Mean	χ^2
1.	**Age of the child**			
	a) 4 – 6 years	9	7	
	b) 6 – 8 years	3	3	2.116
	c) 8 –10 years	2	6	
2.	**Gender**			
	a) Male	6	6	.0826
	b) Female	8	10	
3.	**Education of the child**			
	a) Primary	8	4	
	b) 1 – 3 rd std	4	7	3.23
	c) 4 – 5th std	2	5	
4.	**Religion**			
	a) Hindu	11	11	
	b) Christian	3	5	0.364
	c) Muslim	0	0	
5.	**Education of the father**			
	a) Illiterate	1	0	
	b) Primary	3	8	2.795
	c) Higher secondary	3	3	
	d) Graduate	7	5	

(Table 9 continued)

(Table 9 continues)

S.No.	Demographic Variables	Above Mean	Below Mean	χ^2
6.	**Education of the mother**			
	a) Illiterate	0	1	
	b) Primary	1	6	
	c) Higher secondary	5	3	4.1
	d) Graduate	8	6	
7.	**Occupation of the father**			
	a) Government	3	4	
	b) Private	7	2	5.302
	c) Business	4	7	
	d) Coolie	0	3	
8.	**Family income**			
	a) Below ₹. 5000	0	1	
	b) ₹. 5001-10,000	2	6	4.77
	c) ₹. 10,001 - 20,000	8	4	
	d) ₹. 20,001 and above	6	3	
9.	**Number of children in the family**			
	a) 1	4	4	
	b) 2	9	8	2.344
	c) 3 and above	1	4	
10.	**Birth order**			
	a) 1	6	7	
	b) 2	8	8	1.135
	c) 3	0	1	

(Table 9 continued)

(Table 9 continues)

S.No.	Demographic Variables	Above Mean	Below Mean	χ^2
11..	**Area of residence**			
	a) Urban	11	10	0.92
	b) Rural	3	6	
12.	**Type of family**			
	a) Joint	7	8	0
	b) Nuclear	7	8	
13.	**Any previous exposure to IV cannulation**			
	a) Yes	5	4	0.1426
	b) No	9	12	
14.	**Whether parents are allowed to be with the child during IV cannulation**			
	a) Yes	5	5	0.13
	b) No	9	11	

Table 9 shows the association of post test scores of behavioral response during IV cannulation in experimental group children with selected demographic variables by χ^2. The demographic variables like age of the child, gender, education, religion, education of the father, education of the mother, occupation of the father, family income, number of children in the family, birth order, area of residence, type of family, previous exposure to IV cannulation, whether the parents are allowed to be with the child during IV cannulation were not associated with post test score among experimental group children in calculated values

Table. 10 Association of Selected Demographic Variables with Post Test Behavioral Response Scale Score of Control Group Among Children

(n = 30)

S.No.	Demographic Variables	Above Mean	Below Mean	χ^2
1.	**Age of the child**			
	a) 4 – 6 years	10	4	
	b) 6 – 8 years	4	5	2.130
	c) 8 –10 years	3	4	
2.	**Gender**			
	a) Male	7	7	0.32
	b) Female	10	6	
3.	**Education of the child**			
	a) Primary	8	4	
	b) 1 – 3rd std	6	5	2.92
	c) 4 – 5th std	3	4	
4.	**Religion**			
	a) Hindu	10	10	
	b) Christian	5	2	1.091
	c) Muslim	2	1	
5.	**Education of the father**			
	a) Illiterate	0	0	
	b) Primary	5	1	2.181
	c) Higher secondary	4	4	
	d) Graduate	8	8	

(Table 10 continued)

(Table 10 continues)

S.No.	Demographic Variables	Above Mean	Below Mean	χ^2
6.	**Education of the mother**			
	a) Illiterate	2	0	
	b) Primary	2	1	1.544
	c) Higher secondary	4	3	
	d) Graduate	9	9	
7.	**Occupation of the father**			
	a) Government	6	5	
	b) Private	5	4	0.7885
	c) Business	5	4	
	d) Coolie	1	0	
8.	**Family income**			
	a) Below ₹. 5000	1	0	
	b) ₹. 5001-10,000	1	0	2.77
	c) ₹. 10,001 - 20,000	7	4	
	d) ₹. 20,001 and above	8	9	
9.	**Number of children in the family**			
	a) 1	7	5	
	b) 2	6	7	0.585
	c) 3 and above	4	1	
10.	**Birth order**			
	a) 1	11	8	
	b) 2	2	4	2.43
	c) 3	4	1	

(Table 10 continued)

(Table 10 continues)

S.No.	Demographic Variables	Above Mean	Below Mean	χ^2
11.	**Area of residence**			
	a) Urban	9	6	0.134
	b) Rural	8	7	
12.	**Type of family**			
	a) Joint	6	5	0.03
	b) Nuclear	11	8	
11.	**Any previous exposure to IV cannulation**			
	a) Yes	3	9	4.965*
	b) No	14	4	
12.	**Whether parents are allowed to be with the child during IV cannulation**			
	a) Yes	2	3	0.670
	b) No	15	10	

* Significant

Table 10 shows the association of post test scores of behavioral responses during IV cannulation in control group children with selected demographic variables by χ^2. The demographic variables like previous exposure to IV cannulation is associated with the post test score. The other demographic variables like age of the child, gender, education, religion, education of the father, education of the mother, occupation of the father, family income, number of children's in the family, birth order, area of residence, type of family, whether the parents are allowed to be with the child during IV cannulation were not associated with post test score among control group children in calculated values.

CHAPTER - V

Results and Discussion

The purpose of the study was to find out the effectiveness of kaleidoscope on pain and behavioral responses during IVcannulation among children. The results and the discussion of the study were based on the findings obtained from the statistical analysis and interpretation.

The First Objective was to Assess the Pain and Behavioral Responses During IV Cannulation Among Children in Control Group

The present study revealed that the post test mean score for the control group on pain level is 4.3 and the behavioral response mean score is 8.6.

Cordoni. A, Cordoni. L. E (2009) conducted a double blind placebo controlled trial was conducted among 26 males and 31 female patients aged between 4-12 years who received eutectic mixture of local anesthetics to reduce pain during IV cannulization. 29 patients provide with placebo and 28 patients with EMLA cream provided 45 minutes before. Visual analogue scale was used. EMLA mean pain score (1.25) experienced less pain than those with placebo mean score (8.39)

The Second Objective is to Provide Kaleidoscope to Experimental Group

Shalini. D. Souza (2012) conducted a study to assess the effectiveness of viewing kaleidoscope on bio-physiological parameters among hospitalized children subjected to IV cannulation. 60 children were divided as experimental and control group. Experimental group was distracted with kaleidoscope and control group had given no distraction. FLACC behavioral scale was used. The findings revealed that

experimental group showed less bio-physiological changes when compared to control group

The Third Objective is to Determine the Effectiveness of Kaleidoscope on Pain and Behavioral Responses During IV Cannulation in Experimental Group

The post test pain mean score for experimental group was 1.6 and for control group was 4.3 and the calculated ‘t’ value is 3.91 at p=0.05 level of significance which is greater than the expected table value 1.67. The post test behavioral response mean score for experimental group was 3.43 and for the control group was 8.6 and the calculated ‘t’ value is 14.71 at p=0.05 level of significance which is greater than the expected table value 1.67. This highlights that kaleidoscope has significant effect on pain and behavioral responses among children (4-10 years) during IV cannulation.

Nejla Canbulat (2013) conducted a study in Turkey, to assess the effectiveness of distraction(looking through kaleidoscope) to reduce pain of venipuncture in healthy school age children. The 206 children were divided as experimental and control group. In this study Wong-Baker FACES pain rating scale and Visual Analog Scale was used. At the time of venipuncture the experimental group was distracted with kaleidoscope and control group had no distraction. The study detected that the distraction made with kaleidoscope effectively reduced the pain related to venipuncture in healthy school children.

The Fourth Objective is to Compare the Pain and Behavior of Children in Both Groups Undergoing IV Cannulation

The post test pain mean score for experimental group was 1.6 and for control group was 4.3. The post test behavioral response mean score for experimental group

was 3.43 and for the control group was 8.6. This highlights that there was a significant difference between post test pain mean score in both groups and post test behavioral mean score in both groups.

Movahedi. A. F (2006) conducted a quasi experimental study to assess the effectiveness of local responses prior to venipuncture on pain and behavior among 80 school age children between 6-12 years by purposive sampling. The injection site was refrigerated for 3 minutes using ice bag. Pain, behavior, and physiological responses among children were assessed using CHEOPS. It is being identified that ice refrigeration is very effective in reducing pain. This highlights that there was a significant difference in pain and behavior among the 2 groups.

The Fifth Objective is to Determine the Association of Pain and Behavioral Response with Selected Demographic Variables

There was an association of demographic variables with the post test pain scale score of experimental group among children, the variables like type of family is associated.

There was an association with post test pain scale score of control group among children, the variable like gender is associated.

There was an association of demographic variables with the post test behavioral scale score of control group among children, the variable include any previous exposure to IV cannulation were associated.

There was no association with the post test behavioral response of the experimental group.

CHAPTER - VI

Summary, Conclusion, Nursing Implication, Limitations and Recommendations

Summary

The study was conducted to evaluate the effectiveness of kaleidoscope on pain and behavioral responses among children during IV cannulation in Masonic Hospital at Coimbatore.

The Following Objectives were Set for the Study

- To assess the pain and behavioral responses during IV cannulation in children in control group.
- To provide kaleidoscope to the experimental group.
- To assess the effectiveness of kaleidoscope on pain and behavioral responses during IV cannulation in experimental group.
- To compare the pain and behavioral response of children in both groups undergoing IV Cannulation.
- To determine the association of pain and behavioral responses among experimental and control group with selected Demographic variables.

Hypothesis Set for the Study

H_1 There is a significant difference in the pain and behavioral differences among children undergoing IV cannulation in experimental and control group.

H_2 There is a significant association between the selected demographic variable with the pain and behavioral scores in experimental and control group.

Major Findings of the Study were as Follows

- The post test mean pain scale score of the experimental group was 1.6 and the post test mean pain score of the control group was 4.3.
- The post test mean behavioral response scale score of the experimental group was 3.43 and the post test mean behavioral response scale score of the control group was 8.6.
- The obtained 't' value for comparison of post test score of pain scale at ($p<0.05$) level was 3.91.
- The obtained 't' value for comparison of post test score of behavioral response scale at ($p<0.05$) level was 14.71.
- The post test pain scale score result for experimental group revealed that, 3 (10)% experience no hurt, 12(40)% hurt little bit, 10(33.3)% hurt a little more 4(13.3)% hurt even more, 1(3.3)% hurt a whole lot from pain.
- The post test pain scale score result for control group revealed, 4(13.3) % hurt even more, 12(40)% hurt a whole lot, 14(46.7)% hurt worst from pain.
- The post test behavioral response score result for experimental group, 16(53.3)% experience mild pain, 14(46.7)% experience moderate pain.
- The post test behavioral response score for the control group, 2(6.6)% experience moderate pain, 17(56.7)% shows severe behavioral responses secondary to pain and 11(36.7)% shows very severe responses secondary to pain.
- There was an association between post test pain scale score in type of family with demographic variables in experimental group.
- There was an association between post test pain scale score in gender with demographic variables in control group.

- There was no association between post test behavioral score with the demographic variables in the experimental group.
- There was an association between post test behavioral scale score in any previous exposure to IV cannulation with demographic variables in control group.

Conclusion

The main focus of the study was to assess the effectiveness of kaleidoscope on pain and behavioral responses among children (4-10 yrs) during IV cannulization The mean post test score for pain among experimental group (M=1.6) was lower than the mean post test pain score for the control group (M=4.3) and the calculated 't' value is (t= 3.91) greater than the table value (t=1.67). The mean post test score for behavior responses among experimental group (M=3.43) was lower than the mean post test score for control group (M=8.6) and the calculated 't' value is (t=14.71). The finding shows that kaleidoscope was effective in reducing pain and behavioral responses among children. So the alternative hypothesis was accepted.

The χ^2 was used to find out the association between selected demographic variables with pain and behavior**.** There was an association between post test pain scale score with demographic variables in experimental group. There was an association with the post test pain scale score with demographic variables in control group. There was no association between post test behavioral score with the demographic variables in the experimental group. There was an association between post test behavioral scale score with demographic variables in control group.

Nursing Implications

The findings of the study have implications on nursing practice, nursing education, nursing administration and nursing research.

Nursing Education

- The curriculum of nursing education should enable student nurses to equip themselves within the knowledge of kaleidoscope. The nursing education should give more importance to the application of theory into practice.
- In-service education to nurses and paramedical can be organized with advanced modalities.
- Periodic seminars and group discussions can be arranged regarding care of children with intravenous pain.
- Nursing personal working in various health setting should be given in-service education and training to update their knowledge and skills for reducing level of pain.

Nursing Practice

- The kaleidoscope is a non invasive intervention and it can be emphasized by the staff nurse's to reduce the level of pain and behavioral responses among children.
- Teaching programme can be conducted for parents about pain reduction.

Nursing Administration

- The health care system is responsible to provide educational services for parents and care givers as an integral part of high qualities and cost effectiveness.

- Administrators should organize in-service education programmes, refresher courses and workshops for nurses and encourage them to participate in these activities.
- Leaders in nursing are challenged to undertake health needs of children.
- The administrator should take part in health policy making, developing portal procedures for parent's education.

Nursing Research

- The essence of research is to build up body of knowledge in nursing as it is an evolving profession. The effectiveness of the research can be made by further implication of the study.
- Nurse researcher can do a research on the community to the parents.
- One of the main aims of nursing research is to contribute knowledge to the nurses to expand and broaden the scope of nursing. This is possible only if nurses are taking initiative to conduct further research.
- It can be used for evidence based nursing practice as a rising trend.

Limitations

- The study included only the children who admitted between the age group of 4-10 years in Masonic hospital, Coimbatore.
- Time duration limited to 1 month.
- The size of the sample was small to draw generalizations.

Recommendations

- A randomized control study can be conducted in different setting.
- The similar study can be conducted for a large sample with different age group and different setting to have wider applicability.

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ABSTRACT

Statement of the Problem: A study to assess the effectiveness of kaleidoscope on pain and behavioral responses among children (4-10 years) during IV cannulation in selected hospital, Coimbatore. **Objectives :** (a) To assess the pain and behavioral responses during IV cannulation in children in control group.(b) To provide kaleidoscope to experimental group. (c)To assess the effectiveness of kaleidoscope on pain and behavioral responses during IV cannulation in experimental group. (d) To compare the pain and behavior of children in both groups undergoing IV Cannulation. (e)To determine the association of pain and behavioral responses among experimental and control group with selected Demographic variables. **Methodology :** The research design selected for the study was quasi experimental research design (post test only design) sample size for this study was 60. Pain level during cannulation was assessed by using Wong Bakers faces pain scale and behavioral response was assessed by using modified behavioral pain rating scale and demographic variables were used to collect data. **Results :** Descriptive and inferential statistics were used to analyze the data. The independent 't' test was performed to compare the post test value of experimental and control group. The calculated value of 't' test was 13.2 which is greater than the table value. This shows that there was significant difference in post test value. **Conclusion :** The study revealed that there was decreased level of pain and behavioral responses among children in the experimental group.

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To

Through

The Principal,

PPG College of Nursing

Coimbatore – 35.

Respected Sir,

Sub : Seeking permission for conducting research study

I am a student of M.Sc Nursing in PPG College of Nursing. Our college is affiliated to the Tamilnadu Dr. M. G. R Medical University, Chennai. I have taken the specialization in Child Health Nursing.

Topic : A STUDY TO ASSESS THE EFFECTIVENESS OF KALEIDOSCOPE ON PAIN AND BEHAVIORAL RESPONSES AMONG CHILDREN (4-10 YEARS) DURING IV CANNULATION IN SELECTED HOSPITAL, COIMBATORE

I request you to kindly permit me to conduct my study in your institutions. Hope you will consider my requisition and do the needful.

Thanking you,

Yours sincerely,

Date :

Place : Coimbatore

Requisition Letter for Content Validity

From

M.Sc (N) II Year,
PPG College of Nursing,
Coimbatore – 35.

To

Through : Principal, PPG College of Nursing

Respected Sir/Madam,

Sub : Requisition for expert opinion and suggestion for content validity of tool

I am a student of M.Sc (N) II year, PPG College of Nursing affiliated to the Tamilnadu Dr. M. G. R. Medical University, Chennai. As a partial fulfillment of the M.Sc (N) programme. I am conducting

A STUDY TO ASSESS THE EFFECTIVENESS OF KALEIDOSCOPE ON PAIN AND BEHAVIORAL RESPONSES AMONG CHILDREN (4-10 YEARS) DURING IV CANNULATION IN SELECTED HOSPITAL, COIMBATORE

Herewith I have enclosed the developed tool for content validity and for the expert opinion and possible solution. It would be very kind of you to return the same as early as possible.

Thanking you,

Yours faithfully,

PPG College of Nursing

Format for the Content Validity

Name of the expert :

Address :

Total content for the tool :

Kindly validate each tool and tick wherever applicable

S.No	No. of Tool/Section	Strongly Agree	Agree	O.K	Not Applicable	Need Modification	Remarks

Remarks Signature of the Expert with Date

SECTION - I

Demographic Variables

Instruction

Read every statement carefully and indicate the response that you choose by placing a tick (✓) in the appropriate space given.

Sample No. : _____

1. Age in years
    a) 4-6 ☐
    b) 6-8 ☐
    c) 8-10 ☐

2. Sex
    a) Male ☐
    b) Female ☐

3. Education
    a) Pre primary ☐
    b) 1-3rd std ☐
    c) 4-5th std ☐

4. Religion
    a) Hindu ☐
    b) Christian ☐
    c) Muslim ☐

5. Education of the father

    a) Illiterate ☐

    b) Primary ☐

    c) Higher secondary ☐

    d) Graduate and above ☐

6. Education of the mother

    a) Illiterate ☐

    b) Primary ☐

    c) Higher secondary ☐

    d) Graduate and above ☐

7. Occupation of the father

    a) Government employee ☐

    b) Private employee ☐

    c) Business ☐

    d) Coolie ☐

8. Family income

    a) Below ₹. 5000 ☐

    b) ₹. 5001 - 10,000 ☐

    c) ₹. 10,001 -20,000 ☐

    d) ₹. 20,001& above ☐

9. Number of children in the family

a) 1 ☐

b) 2 ☐

c) 3 and above ☐

10. Birth order

a) I ☐

b) II ☐

c) III ☐

d) Others ☐

11. Area of residence

a) Urban ☐

b) Rural ☐

12. Type of family

a) Joint ☐

b) Nuclear ☐

13. Any previous exposure to IV cannulation

a) Yes ☐

b) No ☐

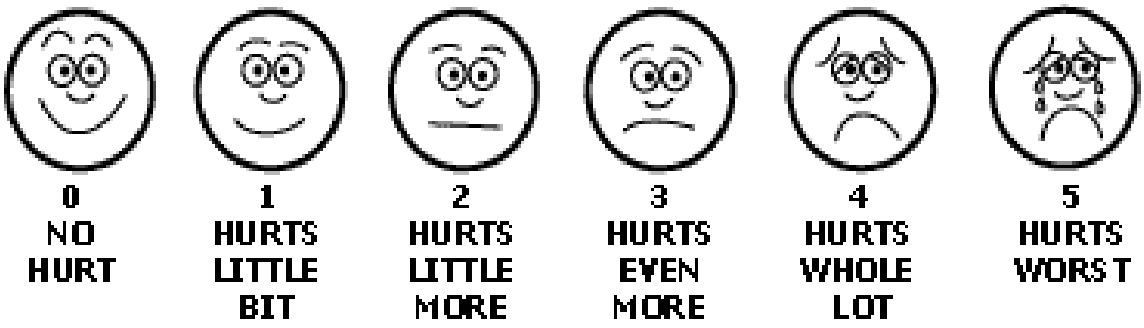
14. Whether the parents are allowed to be with the child during IV cannulation

a) Yes ☐

b) No ☐

SECTION - II

Wong Bakers Faces Pain Scale for Assessment of Pain Among Children



Face 0 hurts - no pain.

Face 1 hurts - pain little bit.

Face 2 hurts - pain little more.

Face 3 hurts - pain even more.

Face 4 hurts - pain whole lot.

Face 5 hurts - pain worst.

Modified Behavioral Pain scale for the Assessment of Behavioral Response

Parameter	Findings	Scoring
Facial expression	Definite positive expression (smiling)	0
	Neutral expression	1
	Slightly negative expression (grimace)	2
	Definite negative expression (furrowed brow eyes closed tightly)	3
Cry	Laughing or giggling	0
	Not crying	1
	Moaning quiet vocalizing gentle or whimpering cry	2
	Full lunged cry	3
	Full lunged cry more than baseline cry	4
Movements	Usual movements and activity	0
	Resting and relaxed	0
	Partial movement (squirming arching limb tensing clenching)	2
	Attempt to avoid the pain by withdrawing the limb	2
	Agitation with complex and general movements	3
	Rigidity	3

Minimum score was 0

Maximum score was 10

Scores	Interpretations
0	Relaxed and comfortable
1 - 3	Mild pain
4 - 6	Moderate pain
7 - 9	Severe pain
10	Very severe

பிரிவு -அ

முறையான நேர்காணல் படிவம்

கீழ் கண்ட வினாக்களுக்கு ஏதேனும் ஒன்றை மட்டும் (✓) இவ்வாறு விடை அளிக்கவும்

ஐபி/ஒபிஎண்:_____

1. வயது:

    அ) 4 முதல் 6 வயது வரை ☐

    ஆ) 6 முதல் 8 வயது வரை ☐

    இ) 8 முதல் 10 வயது வரை ☐

2. பாலினம்

    அ) ஆண் ☐

    ஆ) பெண ☐

3. கல்வி தகுதி

    அ) ஆரம்பக் கல்வி ☐

    ஆ) 1முதல் 3ஆம் வகுப்பு வரை ☐

    இ) 4முதல் 5ஆம் வகுப்பு வரை ☐

4. மதம்

    அ) இந்து ☐

    ஆ) கிறிஸ்தவம் ☐

    இ) முஸ்லீம் ☐

5. தகப்பனாரின் கல்வித்தகுதி

அ) கல்லாதவர் ☐

ஆ) முதன்மைக் கல்வி ☐

இ) மேல்நிலைக் கல்வி ☐

ஈ) பட்டப்படிப்பு ☐

6. தாயின் கல்வித்தகுதி

அ) கல்லாதவர் ☐

ஆ) முதன்மைக் கல்வி ☐

இ) மேல்நிலைக் கல்வி ☐

ஈ) பட்டப்படிப்பு ☐

7. தகப்பனாரின் தொழில்

அ) அரசு பணியாளர் ☐

ஆ) தனியார்துறை பணியாளர் ☐

இ) வியாபாரம் ☐

ஈ) கூலி ☐

8. குடும்ப வருமானம்

அ) < ₹. 5000/- ☐

ஆ) ₹. 5001-10,000/- ☐

இ) ₹. 10,001-20,000/- ☐

ஈ) ≥ ₹. 20,001/- ☐

9. குடும்பத்தில் உள்ள குழந்தைகளின் எண்ணிக்கை

அ) 1 ☐

ஆ) 2 ☐

இ) ≥3 ☐

10. பிறப்பு வரிசை

அ) I ☐

ஆ) II ☐

இ) III ☐

ஈ) மற்றவை ☐

11. வசிக்கும் இடம்

அ) நகர்ப்புறம் ☐

ஆ) கிராமப்புறம் ☐

12. குடும்ப வகை

அ) கூட்டுக்குடும்பம் ☐

ஆ) தனிக்குடும்பம் ☐

13. நரம்பு ஊசி போட்ட முன் அனுபவம் உள்ளதா?

அ) ஆம் ☐

ஆ) இல்லை ☐

14. நரம்பு ஊசி போட்டும் போது பெற்றோர்களை அருகில் இருப்பதற்கு அனுமதித்தார்களா?

அ) ஆம் ☐

ஆ) இல்லை ☐

PROTOCOL

Introduction

Kaleidoscope is a cylinder with mirror containing loose colored objects such as beads or pebbles, or a bit of glass. As viewer look into one end, the light entering the other creates a colorful pattern due to the reflection off the mirror.

Definition

Kaleidoscope is an optical instrument in which the bits of the glass, held loosely at the end of the rotating tube are shown in continually changing symmetrical forms by reflection in two or more mirrors set at angles to each other.

Meaning

The term kaleidoscope was coined 1817 by sir. David Brewster. The kaleidoscope is derived from the ancient Greek (kalos), means “beautiful or beauty” (eidos) , “that which is seen forms shapes, (skopeo) to look , to examine hence “the observer of beautiful forms”

Principle of Mechanism

A kaleidoscope operates the principle of multiple reflection.

How Many Pictures Can be see from a Kaleidoscope

When setting the mirror at 60 degree, so that it forms a triangle and 6 images can be viewed at 60 degree angle and 2 images can viewed when it placed at 90 degree angle.

How Kaleidoscope Distracts the Pain of the Child

While looking through the kaleidoscope, the child will go to an imaginary world. The visual effect from the kaleidoscope produces an illusion.

Articles Needed

- Kaleidoscope
- Pain scale
- Behavioral scale

Pre Procedure

Before the procedure the parents are explained about the kaleidoscope and it is introduced to the parents. The benefits, importance and the action should be explained to them. After the consent from the parents, then only the kaleidoscope is introduced to the child.

Procedure

Just before the cannulation child is being given with kaleidoscope a minute. After that the nurse will do the cannulation. At this time the pain and behavioral responses of the child is rated using Wong Bakers FACES Rating Scale and Modified Behavioral Pain scale.

Benefits

- Reduces the pain intensity
- Saves time
- No need of restraints
- Alleviate the parental anxiety

Conclusion

Kaleidoscope is made with bits of colored plastic or glass. The end of the kaleidoscope is closed off with glass or plastic. This is not only keeps the objects contained, but filters light through to reflect the images the end of the kaleidoscope rotates so that different patterns can be easily created. This will create interest among children.

LIST OF EXPERTS

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5. **Prof. THENMOZHI, M.Sc.,**

   Department of Pediatrics,

   Textcity College of Nursing,

   Coimbatore.

A STUDY TO ASSESS THE EFFECTIVENESS OF KALEIDOSCOPE ON PAIN AND BEHAVIORAL RESPONSES AMONG CHILDREN (4-10 YEARS) DURING IV CANNULATION IN SELECTED HOSPITAL, COIMBATORE

ACKNOWLEDGEMENT

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REFERENCES

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